

MONTANA LEGISLATIVE HISTORY

Chapter 549 19 85

Bill H 639 S _____ Original bill & history C

H. Committee on Business & Labor

Hearing Date(s) Feb 08 ☒ C

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_____ C

Date Out Feb 08 ☒ C

S. Committee on Judiciary

Hearing Date(s) Mar 07 ☒ C

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_____ C

Mar 07 ☒ C

Did this bill originate in an interim committee? ☐ Yes ☐ No

Committee _____

Report _____

HOUSE FINAL STATUS

2/20	HEARING	
2/22	COMMITTEE REPORT-BILL DO PASS	
2/23	2ND READING PASS	92
2/27	3RD READING PASS	98
	TRANSMITTED TO SENATE	
3/06	REFERRED TO NATURAL RESOURCES	
3/22	HEARING	
3/25	COMMITTEE REPORT-BILL CONCURRED	
3/28	2ND READING CONCURRED	50
3/30	3RD READING CONCURRED	49
	RETURNED TO HOUSE	
4/04	SIGNED BY SPEAKER	
4/04	SIGNED BY PRESIDENT	
4/04	TRANSMITTED TO GOVERNOR	
4/08	SIGNED BY GOVERNOR	
	CHAPTER NUMBER 386 EFFECTIVE DATE: 10/01/85	

HB 639 INTRODUCED BY NATHE
 REVISION OF POLYGRAPH LICENSURE LAW
 BY REQUEST OF DEPARTMENT OF COMMERCE

2/02	INTRODUCED	
2/02	REFERRED TO BUSINESS & LABOR	
2/04	FISCAL NOTE REQUESTED	
2/08	HEARING	
2/08	FISCAL NOTE RECEIVED	
2/09	COMMITTEE REPORT-BILL PASS AS AMENDED	
2/09	STATEMENT OF INTENT ATTACHED	
2/11	2ND READING PASS	96
2/13	3RD READING PASS	99
	TRANSMITTED TO SENATE	
2/14	REFERRED TO JUDICIARY	
3/07	HEARING	
3/07	COMM REPORT-BILL CONCURRED AS AMENDED	
3/09	2ND READING CONCURRED	32
3/12	3RD READING CONCURRED	31
	RETURNED TO HOUSE WITH AMENDMENTS	
4/08	2ND READING AMENDMENTS CONCURRED	95
4/08	ON MOTION RULES SUSPENDED PLACED ON 3RD READING THIS DAY	
4/08	3RD READING AMENDMENTS CONCURRED	96
4/15	SIGNED BY SPEAKER	
4/15	SIGNED BY PRESIDENT	
4/16	TRANSMITTED TO GOVERNOR	
4/18	SIGNED BY GOVERNOR	
	CHAPTER NUMBER 547 EFFECTIVE DATE: 4/18/85	

HB 640 INTRODUCED BY WALLIN, RAMIREZ, ET AL.
 PERMITTING ONE WEEK OF UNEMPLOYMENT COMPENSATION
 BENEFITS FOR STRIKERS

2/02	INTRODUCED
2/02	REFERRED TO BUSINESS & LABOR
	DIED IN COMMITTEE

125 projects with the present law. House Bill 554 will inhibit development and put us further behind in competing for development.

Opponent Bill Verwolf, Financial Director, Assistant Manager, City of Helena, stated that the IDR bonds are issued by local government. Mr. Verwolf explained that a reasonable method should be created without tying all contacts to the IDR bond.

Opponent Don Judge, representing the Montana State AFL-CIO, explained that tax benefits are received from the IDR bonds. In the issuance on these bonds, public participation is received, the public is providing revenue and a preference for Montanans is provided. Profits from large companies leave the state, we should build Montana with wages and have licensed contractor's on the job, added Mr. Judge.

In closing, Representative Connelly, stated that the local government systems have not been treated equally and the proposed amendments will allow for equal treatment. Local governments are there to serve the people and state money should be used for Montanan's, stressed Representative Connelly.

Representative Driscoll asked Mr. Fenderson what the bond experience in Helena has been. Mr. Fenderson explained that the developer contractor deals direct.

Representative Kadas asked Mr. Harris how large the private, small business he referred to are and how many people they employ. Mr. Harris explained that approximately 200 people are employed by the 50 - 60 private, small business'.

Representative Hansen asked Mr. Harris if outside workers are being hired. He explained that he has had no direct reports, and after checking in the Kalispell area, all of the projects they had financed, had local workers. Representative Hansen then asked if a request for Montana workers could be a stipulation in the loan. He stated that they can encourage, but not request local workers.

There being no further discussion by proponents or opponents, all were excused by the chairman and the hearing on House Bill 554 was closed.

HOUSE BILL 639: Hearing commenced on House Bill 639. Representative Dennis Nathe, District #19, sponsor of the bill at the request of the Department of Commerce, stated that this bill revises the polygraph licensure laws by creating internships, establishing requirements

for examinations and instruments relating to psychological stress evaluators, and by repealing the prohibition against admission of polygraph examination results as evidence. A statement of intent was distributed to committee members, which is attached hereto as Exhibit 2.

Proponent Fritz O. Dehr, representing the Montana Department of Justice, explained that polygraph and psychological stress tests measure reaction as to telling the truth. A person who received a psychological stress evaluator license also must have polygraph course of instruction. Mr. Dehr added that a psychological stress evaluator device does not meet the minimum requirements in 37-62-301, MCA.

Proponent Michael A. Stotts, representing the Montana Association of Polygraph Examiners, distributed to committee members Exhibit 3, which is attached hereto. Mr. Stotts does not believe in the validity or reliability of psychological stress evaluators. Sections 6, 7 and 8 in the bill should be stricken, psychological stress evaluators are very unprofessional and the subject does not know that they are being tested, added Mr. Stotts. The section that is being repealed would not allow polygraph results to be used in the court of law.

Proponent Mary Lou Garrett, representing the Department of Commerce, explained that the change in renewal dates will make a simpler and more efficient process, renewals will be issued at once, rather than from the date of issuance.

Representative Kadas asked Mr. Dehr why the statute to allow polygraph results was adopted in 1983. Mr. Dehr referred the question to Mr. C. Ron Cutting who answered that the courts and judges wanted it and that it would help prevent improper exams.

Representative Driscoll asked Mr. Dehr if the federal courts allow polygraph tests as evidence. Mr. Dehr stated that they do not.

Representative Wallin asked Mr. Cutting if he agreed with the deletion of section 8. Mr. Cutting explained that he did and that this would help upgrade polygraph examiners, they would maintain well educated and well qualified people.

Representative Kitselman asked Mr. Dehr if a urine test was required due to drugs being taken prior to testing to slow down motor skills. Mr. Dehr explained that a

urine test is not administered, but that an examiner does a spot check and drug use should be apparent.

Representative Hart asked Mr. Stotts the number of licensed examiners. He explained that there are currently seven individuals who have psychological stress evaluator training and of these seven, four also have polygraph training.

Representative Simon asked Mr. Dehr the use for fingerprinting an examiner. Mr. Dehr stated that they need to make sure that these are good, legitimate people with no criminal background.

There being no further discussion by proponents or opponents, all were excused by the chairman and the hearing on House Bill 639 was closed.

HOUSE BILL 468: Hearing commenced on House Bill 468. Representative Kelly Addy, District #94, sponsor of the bill, stated that this bill amends the Electronic Funds Transfer Act to allow a customer of an out-of-state financial institution to use a Montana satellite terminal to withdraw cash or made inquiry about his account balance. Deposits could not be allowed or the site would then be considered a branch bank.

Proponents Les Alke, representing the Montana Bankers Association, explained that 95% of Montana banks currently allow interstate use. House Bill 468 would legalize what is already transpiring and Montana could join these nationwide interchanges.

Proponent Jeff Kirkland, representing the Montana Credit Union League, explained that many individuals who travel do not carry a large amount of cash and that House Bill 468 would be a tourism feature.

Proponent Steve Brown, representing the Montana Independent Bankers, offered his support of the bill.

There being no further discussion by proponents and no opponents to the bill, all were excused by the chairman and the hearing on House Bill 468 was closed.

HOUSE BILL 552: Hearing commenced on House Bill 552. Representative Jan Brown, District #46, sponsor of the bill, supplied written testimony, which is attached hereto as Exhibit 4. Representative Brown also distributed to committee members, Exhibit 5, which is attached hereto.

Proponent Blake Wordal, representing the Montana Hardware and Implement Dealers Association, explained

Representative's Kitselman, Brandewie, Howe, Hart, Keller, Jones and Wallin voting yes. House Bill 460 DO PASS AS AMENDED WITH STATEMENT OF INTENT.

ACTION ON HOUSE BILL 468: Representative Brandewie made a motion that House Bill 468 DO PASS. Second was received and the motion carried unanimously.

ACTION ON HOUSE BILL 554: Representative Kadas moved that House Bill 554 DO PASS. Representative Kadas then moved the proposed amendments. Representative Thomas asked the committee to postpone action on House Bill 554, to allow time for further amendments. Representative Kadas withdrew his motions.

ACTION ON HOUSE BILL 639: Representative Kadas moved DO PASS on House Bill 639. Representative McCormick moved that sections 6, 7 and 8 be stricken from the bill. Said motion was carried unanimously.

Representative Driscoll moved that section 9 be stricken from the bill. He explained that the federal courts don't allow polygraph tests and they are not fool proof. Representative Kitselman added that drugs are being taken to alter the accuracy of this test. Question being called, the amendment did pass unanimously. Representative Nisbet moved to amend the title and section 10 of the bill, which carried unanimously. Representative Simon moved that a section be added to allow for rulemaking authority. Paul Verdon, staff researcher explained that rulemaking authority is not needed but an extension of authority is. A new section granting extension of authority, did pass unanimously. House Bill 639 DO PASS AS AMENDED, by unanimous decision.

ACTION ON HOUSE BILLS 132 AND 162: Chairman Pavlovich explained that the subcommittee suggested committee bills be drafted for House Bill 132 and House Bill 162. Representative Kitselman moved to draft the bills. Representative Glaser, explained that three bills are needed, rather than two. The motion carried unanimously, three committee bills will be prepared.

There being no further business before the committee, the meeting was adjourned at 10:50 a.m.


REP. PAVLOVICH, Chairman

February 8

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MR. SPEAKERWe, your committee on BUSINESS AND LABORhaving had under consideration house Bill No. 639FIRST reading copy (WHITE
color)

REVISION OF POLYGRAPH LICENSURE LAW

Respectfully report as follows: That HOUSE Bill No. 639
BE AMENDED AS FOLLOWS:

- 1) Title, line 8
Following: "RENEWAL"
Strike: the remainder of line 8, lines 9, 10, and 11 in their entirety, and line 12 through "EVIDENCE;"
- 2) Title, line 13
Following: "37-62-204, MCA;"
Strike: "REPEALING SECTION 37-62-302, MCA "
- 3) Page 5, line 9, through Page 6, line 18
Strike: Sections 6, 7, 8, and 9 in their entirety

DO PASS

February 8

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- 4) Page 6, line 19
Following: line 19
Insert: "NEW SECTION. Section 6. Extension of authority. Any existing authority of the department of Commerce to make rules on the subject of the provisions of this act is extended to the provisions of this act."
Renumber: Following sections
- 5) Page 6, line 20
Following: "4"
Strike: "through 8"
Insert: "and 5"
- 6) Page 6, line 22
Following: "4"
Strike: "through 8"
Insert: "and 5"

AND AS AMENDED,
DO PASS
STATEMENT OF INTENT ATTACHED

STATE PUB. CO.
Helena, Mont.

Rep. Robert Pavlovich, Chairman.

STATEMENT OF INTENT

The proposed legislation provides a new license to be issued by the department of commerce concerning polygraph interns.

The proposals give the department (there is no "board of polygraph operators") authority to write rules concerning the application and fee to be established for an intern license and for reporting content and procedures regarding intern training. (See section 3 of the bill.) The rules should be aimed at assuring that the intern is adequately supervised and is given the instruction necessary to achieve licensure.

In accordance with the statement of intent made by the 1983 legislature, no additional rulemaking powers are herein granted to the department pursuant to Title 37, chapter 1.

Exhibit 3
February 8, 1985
House Bill 639

Submitted by: Michael Stotts

Affiliate of



Montana Association of Polygraph Examiners

February 07, 1985

Bob Pavlovich, Chairman
House Business and Labor Committee
Capitol Building
Helena, Montana 59620

To Mr. Pavlovich and Other Distinguished Committee Members:

I urge to you support HB 639 with the exception of New Sections 6, 7 and 8. Those sections would allow PSE, or Psychological Stress Evaluators to be licensed to detect deception or verify truthfulness by means of charting stress from a voice recording. I am opposed to allowing PSE examiners to be licensed for the following reasons:

- 1). The PSE uses only one parameter for indicating stress or "deception". The technique utilizes the theory of a microtremor in the voice which is not well understood or documented. A polygraph instrument records criteria from three separate bodily functions (as defined in 37-62-301).
- 2). The training for PSE examiners is too short to adequately teach all of the aspects of conducting proper examinations.
- 3). There is no national professional organization to ensure ongoing training and update refinements to the technique.
- 4). The potential for abusing PSE is great in that a person can be recorded without their knowing it, even over the telephone. There have been numerous articles published showing results of PSE "tests" being run from recordings of public officials appearing on radio or television.
- 5). Professional research into the validity of the PSE repeatedly results in conclusions that the accuracy of PSE is essentially comparable to ~~one~~ chance (see attached).
- 6). A study done by the Virginia Department of Commerce concluded that they did not find the Audio Stress Evaluator to be an effective method of the determination of deception and the General Assembly took no action to license them (see attached).
- 7). Under the current code, 37-62-301, minimum standards are set for instrumentation. That section would have to be changed or PSE examiners would be in violation.
- 8). Having conducted both polygraph and PSE exams, it is my personal opinion that the PSE should not be used by itself to determine truth or deception.

For the above reasons, I urge you to delete Sections 6, 7 and 8 and to pass the remainder of the bill.

Wendell Frojen

Wendell Frojen
President - M.A.P.E.

another voice stress device, the Voice Stress Analyzer (VSA), produced by Decision Control, Inc., in detection of deception. Kubis's study consisted of a "mock crime paradigm" in which some college students were assigned the role of thief, some were the lookout, and some the innocent bystander. Kubis's findings showed that neither the PSE nor the VSA was effective in discriminating between the three student roles. The PSE yielded an accuracy of 32% (27/85) in detecting individual's roles in one portion of that study and 38% (24/63) in detecting roles within each three-student grouping in another portion against chance expectancy of 33% in each case; the VSA showed an average accuracy of 36% (39/108) in those same situations. On the other hand, polygraphic analysis in Kubis's experiment showed a highly significant overall detection rate of 76%. It is of some interest to note here that Kubis also found that the conditions of his study were sufficiently motivating to produce observable behavioral differences between truthful and deceptive subjects; persons who evaluated only the subjects' behavior during testing were able to discriminate between truthful and untruthful subjects with greater accuracy (53%) than was obtained with the PSE or the VSA.

In another study, Barland (19) carried out two small-scale projects to determine the accuracy of the PSE in lie detection. In the first, he had a group of 16 college students conceal information; they were then tested with the PSE to determine if the concealed information could be detected. The results of that experiment showed that the accuracy of the PSE was at chance levels, 6.25% (1/16), a finding that Barland believed to be related to the students' lack of motivation to deceive. To investigate that hypothesis, Barland, in his second project, tested 14 actual criminal suspects — believed to be highly motivated to deceive — with the PSE and the polygraph. He reported initially that the PSE appeared to indicate reliable changes in the voice associated with deception and that the PSE was more effective in conditions of heightened motivation. In another study, larger in scale and more carefully executed, however, Barland (20) found that the accuracy of the PSE (averaging 51%) did not exceed chance levels (0.50) in detecting deception in criminal suspects, whereas in the same circumstances the polygraph yielded an accuracy of about 90%. Thus, Barland's original hypothesis about the effect of motivation on the effectiveness of voice stress analysis was not supported in his own research.

Nachshon and Feldman (21) reported a series of studies designed to investigate the effectiveness of voice stress analysis in detecting concealed information. In one portion of their study, 20 college students concealed cards chosen from a deck of six cards. The students were then tested with the PSE; evaluation of the PSE data by three trained evaluators yielded an average accuracy rate of 30%, a result not significantly greater than chance expectancy. In another portion of their study, Nachshon and Feldman evaluated the accuracy of the PSE in detecting cards concealed by 19 criminal suspects who were undergoing polygraph examinations. In those presumably more motivating circumstances, Nachshon and Feldman found that the PSE yielded an average accuracy of 19%, ranging between 15% and 26% for the three evaluators; the PSE did not produce an accuracy greater than chance expectancy (0.20).

Two other laboratory-based studies of the accuracy of voice stress analysis were reported by Horvath (22, 23) at Michigan State University. In the first study, 60 college students, 30 male and 30 female, attempted

to conceal numbered cards chosen from a deck of five cards while undergoing simultaneous PSE and polygraph testing. Analysis of PSE response data and polygraphic response data, the galvanic skin response (GSR) in particular, was carried out by two trained evaluators. The detection rates obtained with the PSE averaged 22.5% against chance expectancy of 0.20 and were not significantly affected by subjects' sex, repeated trials of testing, simultaneous use of polygraphic and voice stress equipment, or differences between the two trained evaluators of the PSE data. In that same study, detection rates obtained in scoring GSR responses averaged 68.6% (in the first trial of testing only) against chance expectancy of 0.20, and in all cases the rates were significantly greater than chance.

Horvath(23) also investigated whether or not the accuracy of the PSE could be enhanced by increasing the subjects' motivation to deceive. In this study 64 college students were promised a reward for successfully completing a task involving the concealment of a numbered card chosen from a deck. In spite of the evidence showing that the subjects were indeed considerably motivated by the reward, that motivation did not increase detection rates obtained with voice stress analysis beyond chance levels; the PSE averaged only 18% correct detections against chance expectancy of 0.20. On the other hand, detection rates obtained with only the GSR in that same study averaged 52%, significantly exceeding chance levels.

It is of some interest to note that in both of the studies reported by Horvath, voice stress analysis yielded lower detection rates than were obtained by analysis of each of the three physiological measures recorded polygraphically -- GSR, respiration, and cardiovascular activity(24). Thus, Horvath's findings were remarkably consistent with those reported by Kubis(18); when evaluated in similar contexts voice stress analysis did not yield an accuracy similar to that obtained with the polygraph.

In a recently reported study, Brenner et al(12) carried out a lie detection task in which the PSE was used to detect ten items of personal information concealed by 20 college students. The students were offered a reward if they were successful in avoiding detection of the items. By random scoring of the subject's PSE responses, an average of 20% of the concealed items would have been detected. The results of the analysis showed that the actual detection rates were not significantly different from chance levels. Depending on the manner in which the PSE responses were scored the detection rates varied between 18.6 and 21.0%. When only the clearest voice stress charts were separately evaluated detection rates remained at chance levels; in spite of the large variation noted in the nature of the stress responses, the variation was not related to the experimental manipulations. Brenner et al point out, moreover, that when used to detect concealed information in the same manner as they used the PSE, the polygraph has yielded detection rates as high as 100%.

Objections to the Controlled Studies

The studies discussed to this point represent the bulk of the reliable evidence reported to date about the effectiveness of voice stress analyzers in detecting deception. Although that evidence clearly does not support the claims made about voice stress analyzers, the proponents of such devices challenge that evidence on two major grounds. First and perhaps foremost among the proponents' arguments is that most of the

While the polygraph was used in the investigative phase as described above, the use of its results in determining discipline was limited. Polygraph results were neither the sole nor determinative basis for any disciplinary decision. The polygraph was not used to prove allegations not independently established by other circumstantial evidence. Its results were used solely to reinforce conclusions otherwise supported by circumstantial evidence. Applying this standard, adverse inferences were drawn in only two cases in which the polygraph was used or refused.

In regard to drawing inferences from refusals, in the report relating to one of the special agents, the report notes: "This circumstantial evidence is reinforced by Ertel's refusal to take a polygraph exam despite an official request that he do so." The other case in which inferences were drawn included this statement: "This circumstantial evidence of Barron's culpability is reinforced by his refusal to submit to a requested polygraph exam concerning the BRILAB disclosures, and the adverse inference from his refusal to submit to the exam is strengthened by his willingness to take a polygraph exam in connection with other unauthorized disclosure investigations."

PSE USER LOSES SUIT IN FEDERAL COURT

A civil action was brought by John W. Heisse, Jr., M.D. in the United States District Court for the District of Vermont against the State of Vermont, the Commissioner of Public Safety and the Attorney General. Dr. Heisse said he is a practitioner in the field of truth and deception detection, particularly in the use of the Psychological Stress Evaluator (PSE).

Dr. Heisse alleged that as a PSE operator he and others were denied licenses under Vermont's Polygraph Examiner Act, 26 V.S.A. §2901 et seq. because the statute has been restricted to licensing persons using the polygraph machine. Dr. Heisse claimed the Act violated rights protected by the equal protection and due process clause of the Fourteenth Amendment by arbitrarily discriminating against those who use devices other than the polygraph. He also alleged the Act was unconstitutional on other grounds. In Dr. Heisse's prayer for relief he asked the Court to declare the Act unconstitutional, enjoin its enforcement, establish plaintiff's right to practice truth and deception detection, and award \$250,000 damages, plus interest, costs, and attorney's fees.

The Court noted that Dr. Heisse had used the PSE in Vermont for a number of years despite warnings from the State Police and one of the county prosecuting attorneys that it was illegal to do so. The Court also noted that Dr. Heisse and eleven other PSE operators were denied Vermont licenses in 1978. The letter rejecting their applications for licenses included a copy of an opinion of the State Attorney General which said a PSE user could not be licensed under the statute.

The Court held that the right to practice the profession of truth and deception detection is not a fundamental right protected by

the Constitution; that the state has a valid interest in regulating the practice of a profession which has serious implications for the privacy rights of those subjected to it (noting testimony that the PSE had been used without the subject being aware of the test); and that the statute was not unconstitutionally overbroad or vague. Other claims relating to constitutional issues were also dismissed. In dismissing the suit on December 30, 1980, Judge James S. Holding said the state legislature appropriately adopted a measure to assure the integrity and competency of those administering tests, including the authority to exclude testing methods that do not make manifest the fact that a truth detection test is being performed, and to guard against surreptitious testing.

For a complete text of the opinion, see the December 1980 issue of Polygraph.

VIRGINIA ISSUES REPORT ON LICENSING AUDIO STRESS EXAMINERS

On February 7, 1979, House Resolution No. 45 asked the Virginia Department of Commerce to study the desirability and feasibility of state licensure, certification, or regulation of audio stress examiners. On December 1, 1980, Ruth J. Herrick transmitted to the Governor of Virginia and the General Assembly of Virginia the Report of the Department.

In the background information of the report, the issue was described:

This issue of audio stress examiners revolves around two problems: (1) The ability of the devices to indeed record voice characteristics that result in detection of deception (2) The needed training and/or examination of individuals to operate devices, assuming such are valid.

At the present time audio stress machines are not permitted for use in Virginia. Such activities are restricted to polygraph examiners who may only use a machine measuring at least two physiological reactions which relate to deception. An individual cannot be examined without his knowledge by use of the polygraph.

The issues involved are substantial. If the device is approved for use, it will be used for criminal investigations, employment purposes, and may, upon stipulation, be introduced as evidence in legal proceedings. Since a review of the literature offers no conclusive evidence as to its validity completion of the formal evaluation should be a prerequisite to its licensure.

In 1979, a committee was appointed to conduct the study, and the Department of Commerce staff gathered all available information and literature available on audio stress analysis. They also gathered and summarized all of the state laws, practices in enforcement, and opinions of state Attorney Generals.

To further discharge their responsibilities to the Legislature, the Department of Commerce conducted a field study to assess the reliability of voice stress analysis. This study was conducted in cooperation with the Virginia State Police and Dektor Counterintelligence and Security, Inc. which manufactures the Psychological Stress Evaluator (PSE). Department investigators attended an 80-hour course on the use of the PSE taught by Dektor. The Virginia State Police agreed to tape record actual polygraph examinations for the purpose of charting through the PSE instrument. Forty tapes were charted through the PSE process by the Department and by PSE examiners of Dektor. The results obtained by the PSE examiners and the polygraph examiners were then correlated by an independent firm, Psychological Consultants, Inc. (The firm's complete report appears in the December issue of Polygraph.)

Findings: The following is quoted from the report.

The study established no significant relationship between results obtained from the PSE examination of criminal suspects and those obtained from polygraph examination of the same subjects. In addition, there is no significant evidence that different PSE examiners will reach similar conclusions when examining the same data tapes.

The most damning fact concerning the accuracy of the machine is that there is no consistent comparison in any aspect of the tests with any operator. They all have different results in all aspects of the test. Hence, the guilt or innocence of an individual is determined by the operator of the machine at any given time and not by any absolute that can be consistently read by interchangeable operators of the machine. As Dr. Filer says, 'Thus, by all conventional standards of proof, we have to regard the validity and reliability of the Psychological Stress Evaluator as unproven. Indeed, it appears that by and large its validity and reliability are not only unproven, but rather are disproven.'

Executive Summary and Recommendation: The following is quoted from the report.

In its study of voice stress analysis, the Board of Commerce did not find the Audio Stress Evaluator an effective method of the determination of deception.

The validation study, conducted by the Department, established no relationship between results obtained from PSE examination of criminal suspects and those obtained from polygraph examination.

Based upon the above finding, the Department of Commerce recommends to the 1981 Virginia General Assembly that no action be taken to regulate Audio Stress Examiners under Chapter 27, Title 54 of the Code of Virginia.

Table 2.—Reviews of Field Studies of Polygraph Validity

Study ^b /N ^e	Year	Q ^c	D ^d	Abrams (1973)	Horvath (1976)	Raskin & Podlesny (1979) ^a	Lykken (1981)	Ben-Shakhar (1982)	Ansley (1983) ⁱ
Reported "hit rate" (%) ^f									
Blitterman and Marcuse (N=2Ex, 81S)	1947	R/I		[100]	NR	NR	EX ^g	NR	[100]
Ben-Ishal (N=1E, 100C)	1962	C	A	NR ^h	NR	NR	NR	NR	[97.0] ^j
Ben-Ishal (N = 1E, 10C)	1962	C	A	NR	NR	NR	NR	NR	[100]
Bersh (N=4E, 216C)	1969	C	G I A	NR		NR		85.6 89.3	
Horvath and Reid	1971	C	G I A	[79.1-91.4] ^k	[74.6-92.4] ^j EX ^l	75-89 ^k 89-94 ^k	[75-92] ^j EX ^l	85.0 90.5	[96.2] ⁱ NR
Hunter and Ash	1973	C	G I A	—	EX ^l	88 86	EX ^l	87.1 85.7	NR
Wicklander and Hunter	1975	C	G I A	—	EX ^l	95 93	EX ^l	90.0 86.7	NR
Slowick and Buckley	1975	C	G I A	—	EX ^l	85 93	EX ^l	83.8 90.5	NR
Raskin (3 studies)	1976 ⁿ	C	G I A	—	—	93-100 ^m 69-95 ^m	NR	NR	NR
Barland and Raskin (N=102C)	1976	C	G I A	—		NR	98 45	83.0 29.4	NR
Horvath	1977	C	G I A	—	[78.7-89.7] ^o EX ^l	NR	[72] 77	77.1 51.1	NR
Davidson	1979	C		—	—	—	NR	NR	EX ^l
Edwards (N=80E, 959C)	1981		A	—	—	—	NR	NR	[98.3] ^p
Elaad (N=184C)	unpublished 1976		A	—	—	NR	NR	NR	[98.3] ^q
Peters (N=172C)	unpublished 1982		A	—	—	—	—	—	[95.1] ^r
Widacki (N=38C)	unpublished 1982	Z	A G I A	—	—	90 89	—	83-84 ^r 76-81 ^r	[95.8] ⁱ
Author's conclusion (if any)				98††	NR		64-72 ^s		97.6

^aNot technically a review. Original review (126) relied on lab evidence. When criticized by Lykken, authors responded in part by citing field studies.

^bPresented in chronological order.

^cQ = question type (C = control question; R/I = relevant/irrelevant; Z = zone of comparison).

^dD = correct decision or rate of agreement (i.e., hit rate) for guilty (deceptive) (G) or innocent (nondeceptive) (I) subjects.

^eA = average hit rate (in cases where G and I are not reported separately).

^fN = number. Ex = number of examiners; E = number of evaluators; C = number of cases evaluated; S = number of subjects when actual subjects are tested in the study.

^gDifferent studies use different criteria for validity. Thus, the hit rate can be either polygraphers' agreement with ground truth (e.g., Blitterman and Marcuse), blind evaluators' agreement with polygraph examinations verified by confessions (e.g., Horvath and Reid, Hunter and Ash, Wicklander and Hunter, Slowick and Buckley, Horvath), or polygraph examinations validated by a panel of judges using other criteria (e.g., Bersh, Barland, and Raskin) or actual judicial outcome (Widacki). Researchers have not agreed on what constitutes an appropriate criterion for validity in the field.

^hExcluded by Lykken as not useful evidence because of base rate problem: the examiners in the study assumed only one person was guilty. Therefore, they would have had a 99-percent accuracy rate even if they had called everyone innocent.

ⁱNR = not reported by the reviewer indicated.

^jIt is important to note Ansley's method of calculating overall accuracy. When there are inconclusives (or disagreements between the original examiners and the evaluator), Ansley divides the percent inconclusive by 2 and adds one-half the percentage to the accuracy percent reported by the original researcher.

^kThe 74.6 percent figure is for majority decision; 92.4 percent for unanimous decision.

^lThe lower rate is the accuracy rate for inexperienced polygraphers; the higher rate is the accuracy rate for experienced polygraphers.

^mExcluded because they are seen as reliability studies. Horvath reasons that they used confessions as a criterion and because confessions are not independent of polygraphers' examinations "their usefulness as a criterion measure for estimating validity is limited." Lykken excludes them because both examiners and evaluators were Reid polygraphers.

ⁿLower rate is for nonnumerical evaluation; higher rate for numerical evaluations.

^oFocus of study was to test the "friendly polygrapher" hypothesis (see Raskin, Barland, and Podlesny, 1978).

^p78.7 percent = agreement between simple majority on panel and polygraph decision; 86.7 percent = agreement between 4/5 majority on panel and polygraph; 89.7 percent = agreement between judicial outcome and polygraph (where judiciary not aware of polygraph results).

^qOf 2,433 polygraph examinations in the original pool, only 959 (39.4 percent) could be verified as to truthfulness or not; of these 959, 943 were found to be correct. The 98.3 percent figure reported by Ansley represents 943/959 and does not take into account the entire pool of examinations.

^rActually, of 1984 cases that were confirmed, 10 were inconclusive and 6 were errors. The percent accuracy given in Ansley's review excludes the inconclusive results and adds half the error rate to the accuracy rate. If one appropriately excludes both and inconclusives and the error rate, the accuracy rate is at most 87 percent.

^sThe lower rate is for studies using confessions criteria; higher rate is for studies using panel of experts criteria. Figures are rounded.

^tLie control test only.

^uCalculations based on Lykken's conclusion that 6 out of 11 innocent subjects were judged deceptive.

^v††Abrams uses many other studies to come to this conclusion. Many are anecdotal. Other researchers (e.g., Horvath) say they should not be relied on.

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- B. Validity Study of the Psychological Stress Evaluator.

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Frank Horvath
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- E. The Reliability of Polygraph Examiner of Truth and Deception.

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Court Cases

- F. Paz v. Board of Polygraph Examiners 371 So.2d 415 (1979).

Denied a license by the Mississippi Board of Polygraph Examiners because he was a P.S.E. operator, and not a polygraph examiner.

Circuit Court of Jackson County affirmed the order of the Board of Polygraph Examiners in denying a license to appellant Paz. Supreme Court of Mississippi held that the order of the Circuit Court of Jackson County was without error.
- Opinion of the Attorney General of Alabama.
- Since the Dektor P.S.E. does not record cardiovascular or respiratory patterns, it does not meet the minimum instrumentation requirement.

P.S.E. Operator prosecuted in South Carolina.

P.S.E. Operator arrested in Alabama.

References

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P.S.E. school owner charged with felony fraud in Virginia.

The Supreme Court's opinion clearly establishes that the use of the P.S.E. ALONE to detect deception is illegal in Illinois.

A
Report of the Department of Commerce on the
Feasibility and Desirability of Licensure of
Audio Stress Examiners to the Governor and The
General Assembly of Virginia

House Document 5
Commonwealth of Virginia
Richmond, Virginia
1981

House Resolution No. 45

Requesting the Department of Commerce to conduct a study of the desirability and feasibility of licensure of audio stress examiners.

Agreed to by the House of Delegates, February 7, 1979

Whereas, the practice of certain professions and occupations is regulated by State law for the protection of the health, safety, and welfare of the public; and

Whereas, current State law, and regulation promulgated under such law, regulates the activities of polygraph examiners; and

Whereas, through the operation of an audio stress evaluator it has been alleged that an audio stress examiner can perform much the same tasks as are presently being carried out by polygraph examiners; and

Whereas, it is highly desirable that an unbiased and informed study of audio stress examiners be conducted prior to a decision as to the need for State regulation of their profession; now, therefore, be it

Resolved by the House of Delegates. That the Department of Commerce is requested to study the desirability and feasibility of State licensure, certification or regulation of audio stress examiners. The Department is requested to lay its findings, together with any legislative recommendations, before the nineteen hundred eighty Session of the General Assembly.

Executive Summary and Recommendation

In its study of voice stress analysis, the Board of Commerce did not find the Audio Stress Evaluator an effective method for the determination of deception.

The validation study, conducted by the Department, established no relationship between results obtained from PSE examination of criminal suspects and those obtained from polygraph examination.

Based upon the above findings, the Department of Commerce recommends to the 1981 Virginia General Assembly that no action be taken to regulate Audio Stress Examiners under Chapter 27, Title 54 of the Code of Virginia.

Virginia PSE Report

Background Information

This issue of audio stress examiners revolves around two problems: (1) The ability of the devices to indeed record voice characteristics that result in detection of deception (2) The needed training and/or examination of individuals to operate devices, assuming such are valid.

At the present time audio stress machines are not permitted for use in Virginia. Such activities are restricted to polygraph examiners who may only use a machine measuring at least two physiological reactions which relate to deception. An individual cannot be examined without his knowledge by use of the polygraph.

Unlike the polygraph, however, audio stress devices purport to detect deception by measurement of the presence or absence of "microtremors" which are reflected in the voice. Responses to questions may be tape recorded and then charted or converted by the actual devices to a pattern. Patterns are then "read" by trained individuals. Some devices bypass the taping procedure and produce an indication of truth or deception immediately. The devices could be used without the subject of the examination being aware that such examination is being conducted.

Pursuant to House Resolution 45, the Department of Commerce, through the Board of Commerce, spent the last year in study of an audio stress device manufactured in Virginia, has surveyed the literature and is conducting an evaluation in conjunction with the State Police to compare this device to the polygraph.

The issues involved are substantial. If the device is approved for use, it will be used for criminal investigations, employment purposes, and may, upon stipulation, be introduced as evidence in legal proceedings. Since a review of the literature offers no conclusive evidence as to its validity, completion of the formal evaluation should be a prerequisite to its licensure.

In March of 1979 a subcommittee of the Board of Commerce was appointed to conduct the study. The appointees to the study are Mrs. Polly Y. Campbell, Mr. Zack T. Perdue, and Mr. Alan McCullough, Jr., as Chairman.

The staff began the study by gathering all available information and literature on the subject of audio stress analysis. Those persons recognized in the field of detection of deception were notified of the study and were requested to make all information available. The studies and reports received were reviewed for all pertinent information concerning the use of the audio stress machines.

Voice stress analyzers are widely used in the private sector, and by law enforcement agencies; however, their use remains controversial. Investigation of research literature indicates conflicting opinions of the reliability and validity of voice stress analyzers. The accuracy rate of the machines and the operators to detect deception range from 32 percent to one of 100 percent.

From the literature available on the subject of voice stress analysis, it is reasonable to conclude that the effectiveness of the method in

accurately detecting deception has not been resolved. (See Appendix C.)

At the present time, of the twenty-five states that license polygraph examiners, only one, North Carolina, issues licenses to voice stress operators. Four states, Alabama, Mississippi, Oklahoma and Oregon, have opinions from their Attorneys General to the effect that the PSE and similar devices may not be used. In Illinois a circuit court has issued an injunction against their use. New York has passed a statute specifically prohibiting the use of the PSE and similar devices in the employment context. In Pennsylvania it is illegal to use these devices surreptitiously. In Texas voice stress operators have been jailed and fined for using their equipment within the state. In Virginia recently a voice stress operator was fined for illegal use of the machine within the state. The state of Florida held public hearings in 1974 concerning the Psychological Stress Evaluator. The hearing officer concluded that the PSE in the hands of a competently trained operator is equally as credible as to the polygraph. At this time, however, audio stress examiners are not required to be licensed.

The Department of Commerce conducted a field study to assess the reliability of voice stress analysis. This evaluation was conducted in conjunction and cooperation with the Virginia State Police and Dektor Counterintelligence and Security, Inc. Dektor Counterintelligence and Security, Inc., agreed to allow department investigators to attend an 80-hour course in the use of the PSE. The Virginia State Police agreed to tape record actual polygraph examinations for the purpose of charting through the PSE instrument.

A meeting was held at the Department of Commerce to formally establish the field study and to delineate the areas of responsibility to those participating in the field evaluation. Representatives of the Department of Commerce, the Virginia State Police and Dektor Counterintelligence and Security, Inc. were present and agreed substantially to the design of the evaluation.

In accordance with the study, two assumptions were made by the Department: (1) that the General Assembly licensed polygraph examiners and the use of the polygraph machine in Virginia; therefore, the polygraph process is assumed to be reliable in detecting deception; (2) that both the PSE operator from Dektor and the state Police polygraphers were competent in their field.

It was decided that the Virginia State Police polygraph examiners, using their equipment, would tape record polygraph examinations. The results of the examinations and the tapes would be sent to the Department. The tapes would then be distributed to a PSE examiner of Dektor Counterintelligence and Security, Inc. and the investigators of the Department to be charted through the PSE process. The results obtained by the PSE examiners and the polygraph examiners would then be correlated by an independent statistician from Psychological Consultants, Inc. for comparisons of the voice stress analysis method for the polygraph.

It was decided that a total of at least forty tapes would be charted through the PSE process, as this would provide a significant data base.

Virginia PSE Report

Findings

The study established no significant relationship between results obtained from the PSE examination of criminal suspects and those obtained from polygraph examination of the same subjects. In addition, there is no significant evidence that different PSE examiners will reach similar conclusions when examining the same data tapes.

When the results of the voice analysis #1 was compared with voice analysis #2, they agreed 31.7% of the time and disagreed 24.4% of the time. Voice analysis #1 vs Voice analysis #3 agreed 38.1% of the time and disagreed 26.1% of the time. Voice analysis #2 agreed with voice analysis #3 41.8% and disagreed 34.9% of the time. See Table 10, Appendix B.

The most damning fact concerning the accuracy of the machine is that there is no consistent comparison in any aspect of the tests with any operator. They all have different results in all aspects of the test. Hence, the guilt or innocence of an individual is determined by the operator of the machine at any given time and not by any absolute that can be consistently read by interchangeable operators of the machine. As Dr. Filer says, "Thus, by all conventional standards of proof, we have to regard the validity and reliability of the Psychological Stress Evaluator as unproven. Indeed, it appears that by and large its validity and reliability are not only unproven, but rather are disproven." See Appendix B, Psychological Consultants, Inc.

APPENDIX A

AUDIO STRESS STUDY

BOARD OF COMMERCE COMMITTEE MEMBERS

Alan McCullough, Jr., Chairman
Polly Y. Campbell
Zack T. Perdue

PARTICIPANTS

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Virginia State Police
Department of Commerce
Psychological Consultants, Inc.
Dektor Counterintelligence & Security
Virginia State Police
Virginia State Police
Department of Commerce
Dektor Counterintelligence & Security
Psychological Consultants, Inc.
Virginia State Police
Department of Commerce

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APPENDIX B

Psychological Consultants, Inc.
6724 Patterson Avenue
Richmond, Virginia 23226

REPORT ON THE INVESTIGATION OF
THE VALIDITY OF THE PSYCHOLOGICAL STRESS EVALUATOR
For
THE VIRGINIA STATE DEPARTMENT OF COMMERCE
September, 1980

The following report summarizes the results of a study performed by Psychological Consultants, Inc. (PCI) to determine the potential use validity of a Psychological Stress Evaluator (PSE) for the Virginia State Department of Commerce. The PSE is a vocal stress analysis technique which purports to be able to measure whether or not an individual's responses to a set of structured questions exhibit an attempt to present a deceptive pattern. Advocates of the PSE have proposed that it would be of significant value in a number of situations. Among these are criminal investigations and pre-employment screening. Clearly, usages with such inherent potential for significantly affecting the lives of individuals require that validity and reliability in order for its use to be sanctioned. It is important to bear in mind that while academic researchers couch their findings in terms of "statistical significance" (results different from chance), American Jurisprudence requires a far tougher standard of proof, that of "beyond reasonable doubt." While this level of accuracy is not constitutionally required of any input into the judicial process, it is clear that before sanctioning any device or technique, those in a position of responsibility must demand proven levels of value concomitant with that device's potential influence over individuals.

Section I - Summary of Relevant Literature Findings

The literature with respect to vocal stress analysis techniques (in particular the PSE) can best be described as mixed. Discounting wild claims on the part of the manufacturer, there do appear to be a number of studies which indicate a potential for obtaining accurate information from the PSE. Three of these (Kradz, Kriete and Stanley, and Heisse) claim accuracies for the PSE in excess of ninety-five percent when compared with either polygraph findings or known results of criminal investigations. A fourth study (Barland, 1975) finds a significantly lower, although still statistically significant, correlation between PSE results and polygraph analyses.

On the other hand, a number of studies have failed to confirm these findings. Among these are studies by Brenner and Branscomb, Kubis, Horvath, Nacheshon, Suzuki et al., Link, Older and Jenney, and Barland (1973). It is recognized that the Kubis study was negatively received by Dektor Corporation (the manufacturers of the PSE) and that a number of potentially valid criticisms of its research design have been raised. No study, whether it reaches favorable or unfavorable conclusions with regard to validity of the PSE, can be regarded as the definitive word on the issue. Rather, each study must be evaluated in the context of other

available information and the overall pattern emerging from the sum total of available research.

In this light, there appear to be two disturbing questions that are continually raised in the analysis of the PSE. First of all, a number of studies have found that the PSE fails to correlate at a better-than-chance level with results from traditional polygraph analysis. While the Kubis study was perhaps the first and most widely quoted of these, it by no means stands alone. Similar results were found by Horvath, Nacheshon, Suzuki et al., and Barland (1973). Further questions are raised concerning the PSE by the relatively low level of interrater reliability reported in several studies. (See, for example, Brenner and Branscomb, Horvath, and Nacheshon). It is clear that if independent judges cannot reach significant agreement on the amount of deception indicated by the PSE, then the results of this process cannot be regarded as valid for use.

We do not need to go as far as David Raskin (professor of psychology at the University of Utah) who concluded in Congressional testimony that "there is not a single respectable, scientific study, and one that would meet the standards of publication in a scientific journal, which has shown the voice stress analysis technique to be any better than flipping a coin", in order to have serious reservations concerning its use. For example, it is recognized that some studies (see Kratz) have reported high levels of interrater reliability. It is not necessary, however, to question the results of this study, although such might be possible. It is sufficient to indicate that in numerous occasions, interrater reliability was not significant. Thus, simply because two raters in one situation did agree with each other, the results cannot be extrapolated to an assumption that the technique is consistent. There is sufficient evidence from numerous studies to conclude, rather, that in general, raters exhibit a low level of consistency when evaluating the same information. Similarly, it is not necessary to disprove all studies which indicate a high degree of accuracy or correlation with polygraph results in order to disapprove of the use of the PSE. The conclusion that in some contexts or some situations the PSE may be accurate, while in others it exhibits results no better than chance, is strong enough to justify withholding blanket approval of the device. Rather, the existence of a large number of studies which raise significant questions with regard to the PSE's accuracy and consistency throws the "burden of proof" back to its advocates. At the moment, the literature does not appear to indicate a sufficient degree of reliability or predictive accuracy to warrant the usage of the PSE.

However, there remain sufficient questions to indicate the desirability of further research. In this light, another study regarding the accuracy and reliability of the PSE was conducted by Psychological Consultants, Inc. for the Department of Commerce of the State of Virginia.

Section II - Methodology

The current study focuses on three questions: (1) To what extent do results obtained by professionally trained PSE examiners correlate with those obtained by conventional use of the polygraph? (2) How consistent are results obtained when different examiners analyze PSE data? and (3) To what extent does tape quality affect the validity of the PSE analyses?

Data for the study were provided by the Virginia State Police. Tape recordings were made of actual polygraph examination sessions. Charts of these tape recordings were made using the Psychological Stress Evaluator and these charts were independently analyzed by three PSE examiners. One of these examiners was a professional in the employ of Dektor Corporation, the device's manufacturer, while the other two were employees of the Virginia State Department of Commerce who had been trained in the usage of the PSE and certified as competent PSE analysts by Dektor Corporation. After eliminating unusable sessions from the sample, there remained a set of fifty observations. Each observation consisted of one polygraph examination results and three associated PSE examination results. A number of comparisons and analyses were performed and will be reported in detail below.

In theory, it was possible to compare results on individual questions or charts as well as overall examination conclusions. In light of the poor overall performance of the PSE to be reported below, however, it was judged unnecessary to focus on specific components. The data at this level performs even less well than overall conclusions, and its reportage would make the final report unnecessarily burdensome. Results to be reported include the relationships between PSE results (averaged across the three examiners) with polygraph results, the relationship between individual PSE results and polygraph results, the relationship between PSE results and polygraph results for each of the three examiners, and the interrelationship of PSE results for each pair of examiners.

The data provided by State Police was generated in the course of actual investigations. The vast preponderance of the subjects were suspects in criminal investigations, although some were being questioned as either witnesses or victims.

Section III - Results

At the end of each PSE or polygraph examination session, the examiner placed his or her conclusions into one of three categories. It was concluded that either the subject was definitely being truthful, was definitely attempting to deceive the examiner, or else that no conclusion could be reached and the session should be regarded as inconclusive. With three categories, an individual attempting to guess the results of a polygraph examination on the basis of no information at all would be expected to be correct approximately one-third (33%) of the time. Results obtained from the PSE should always be examined in this light.

Three-way contingency tables comparing vocal stress analyzer results with those from polygraph examinations or the results obtained by two individual vocal stress analysts have been generated. There are a number of statistics which might be used to evaluate the degree of association between these variables. The most common such statistic, and the PSE, is the Chi square statistic. This statistic measures whether the distribution of observation into cells of the contingency table is essentially random or whether there exists an association between observations on one variable and those on the other variable. There is, however, another statistic which utilizes more of the available information. The results of the polygraph and PSE examinations possess what are known as ordinal properties. That is, although there is no uniform spacing between the categories, there is an appropriate ordering of the categories. Essentially,

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this says that if a polygraph examination concludes that the subject was being definitely truthful, a vocal stress analysis which concludes that the subject was attempting to deceive is in less agreement than one which finds an inconclusive pattern. While the commonly used correlation coefficient (Pearson r) is not appropriate with ordinal data, a form of rank order correlation coefficient (Kendall Tau) is appropriate and can make use of this ranking property of the observations. For each of the analyses reported below, both Chi square statistics and Kendall Tau coefficients will be reported. Conventionally, levels of statistical significance of .10 or less are required in order for a researcher to regard an hypothesis as being substantiated. Essentially, this says that there is less than ten percent chance that any associations observed in the data could have arisen by chance. Any results percent probability of chance occurrence must be dismissed as inconclusive. It should be emphasized that this ten percent significance level is extremely liberal, and that many researchers require a much lower probability of chance occurrence before regarding an hypothesis as being established.

With three PSE examiners for each polygraph session, there are a total of 150 possible pairs of observations. In fact, analyses are based on somewhat smaller sample sizes. In ten of the fifty cases, at least one of the PSE examiners was unable to evaluate the tape. Thus, there are forty cases for which complete results are available. In most of the other ten cases, however, at least one of the PSE examiners was able to evaluate the session and reach a conclusion. Therefore, there are a total of 138 pairs of polygraph/PSE results. Of these, the PSE examiners raised some question as to the tape quality in twenty cases, leaving a total of 118 pairs of results where no question as to the ability of the vocal stress analyzer tapes to be rated was raised.

Table 1 reports the results when polygraph results were compared with the average ranking obtained by the three PSE examiners. It is obvious that the distribution of results across the various cells of the table is relatively close to the conclusions reached by the two methods. Neither the Chi square statistic nor the Kendall Tau approached anything close to a level of statistical significance. There is, however, one reservation which must be raised in conjunction with this table. The averaging of the PSE results contains an implicit assumption of at least some cardinal rather than ordinal properties in the data. That is, it assumes that an inconclusive result lies exactly half-way between a definitely truthful result and a definitely deceptive result. This concept of "distance" is somewhat strange with regard to the current type of data. Therefore, more satisfactory results may be obtained by comparing the polygraph result with each individual PSE result. This generates the above-mentioned 138 pairs of observation. The fact that each polygraph result is paired with more than one PSE result does not in any way affect the statistical properties of the analysis.

Table 2 shows the results of such a comparison. As can be seen in the table, once again there is an overall impression of randomness in the two sets of results. For example, of the sixty-one cases where the polygraph examination indicated that the subject was definitely being truthful, the PSE indicated definite truth in twenty-four and definite deception in twenty-seven, with ten tapes being regarded as inconclusive. Overall, results of the PSE exams agreed with results of the polygraph exam in 39% of

coins. This result is not statistically significantly different from chance. In fact, to extend the analysis even further, in 30% of the cases, the PSE results were diametrically opposed to the polygraph results. That is, one device gave a reading of definitely truthful while the other was indicating definite deception. This is somewhat higher than might be expected as a result of chance. Therefore, one than might be expected as a result of chance. Therefore, one is left with the conclusion that there is no discernable or measureable relationship between results from a professionally conducted vocal stress analysis examination and results from a professionally conducted polygraph examination.

This finding is not dependent upon the inclusion of questionable tapes in the PSE sample. Table 3 shows results when only those tapes with regard to which no question at all was raised by the PSE examiner are included in the study. Based on these 118 "good" pairs of observations, the above-stated results must be resubstantiated. Once again, there is no statistically significant correlation between results obtained by the two processes. Indeed, in a statistical sense, the PSE performs somewhat closer to the polygraph when the questionable tapes are included than when they are omitted.

It is also clear that no individual PSE analyst is able to satisfactorily correlate his or her results with those obtained from the polygraph, although some analysts do better at this than others. Tables 4 through 6 show the results when each analyst's conclusions are related individually to those resulting from the polygraph session. Table 4 represents the performance of the professional employee of Dektor Corporation while tables 5 and 6 represent the performance of the employees of the Virginia State Department of Commerce. It is interesting to note that substantially the worst performance was recorded by the Dektor employee. However, once again, it should be emphasized that no individual analyst was able to predict significantly the results obtained from the polygraph.

Finally, we turn to the interrater reliability of the PSE conclusions. Once again, the results are not statistically significant. Tables 7 through 9 report the results obtained for the three possible pairs of ratings. It can be seen that in no case did the raters agree on even 50% of the possible conclusions. Rater 1 (the professional Dektor employee) agreed with the two Department of Commerce employees 38% and 42% of the time, while the two Department of Commerce employees agreed only 32% of the time. It must be emphasized that not only did the PSE results not correlate significantly with the polygraph results in any possible experimental configuration, but that there was, in addition, no significant relationship between results obtained by three professionally trained PSE examiners using the same tapes.

Section IV - Conclusions and Recommendations

The conclusions of the current study can be succinctly and powerfully stated. From this research, it cannot be established that there is any statistically significant relationship between results obtained from PSE examination of criminal suspects and those obtained from polygraph examination of the same subjects. In addition, there is no statistically significant evidence that multiple PSE examiners will reach similar

conclusions when examining the same data tapes. The implication of this finding is that the results obtained from a PSE examination of an individual will vary depending upon who conducts the examination. To return to the three questions outlined for the current study, it is possible to reach the following conclusions.

1. We have no evidence that the PSE results are significantly related to those obtained from polygraph examinations. Thus, it is not possible to reject the hypothesis that PSE examination results are totally independent of those obtained by polygraph exams. It should be emphasized that this finding only enables us to conclude that the PSE is not equivalent to the polygraph. It can make no judgement as to the inherent validity of either methods. While it is unlikely it is possible that the results of the PSE examinations were accurate and those of the polygraph were inaccurate in this study. Given the large volume of data available regarding the polygraph and the mixed performance of the PSE in other studies, as outlined above, we are inclined to doubt that such is the case, however. It is clear that both of the devices cannot possibly be accurate.

2. It does not appear that the poor performance of the Psychological Stress Evaluator is the result of the forced conclusions of less-than-adequate data. The device performs no better when analysts were allowed to exclude all tapes with regard to which they had any question about their suitability.

3. It is also abundantly clear from the data that we cannot accept the hypothesis that there is any relationship between PSE results obtained by one examiner and those obtained by another examiner from the same data. This is an especially disturbing conclusion because it implies that a subject's truthfulness or deception is not a function of what the subject himself says, but rather simply a function of which particular examiner is conducting the analysis. This suggests very strongly that the PSE does not provide valid data for use in either employment or criminological investigations.

When the results of the current study are combined with those from other studies outlined above, the following conclusions and recommendations can be made. Although there is some evidence from some studies that the Psychological Stress Evaluator have validity in some situations in assessing truthfulness or deceptive intent on the part of individuals, there remain significant questions as to its value. It appears that the preponderance of research, including the current study, strongly suggests that the Psychological Stress Evaluator can do no better than blind guessing in predicting the results obtained from more conventional methods of stress measurement (especially the polygraph). In addition, numerous studies, including the current one, have found that there is no significant inter-rater reliability between various individuals evaluating the same data using the PSE. Thus, by all conventional standards of proof, we have to regard the validity and reliability of the Psychological Stress Evaluator as unproven. Indeed, it appears that by and large its validity and reliability are not only unproven, but rather are disproven.

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TABLE 1

AVERAGE RESULTS OF VOICE ANALYZER

Result of Polygraph Exam	Definitely Truthful			Incon- clusive			Definitely Deceptive	Row Total
	0	2	4	2	7	1	2	18
Definitely Truthful	0.0%	5.0%	10.0%	5.0%	17.5%	2.5%	5.0%	45.0%
Inconclu- sive	0	2	0	4	0	1	2	9
	0.0%	5.0%	0.0%	10.0%	0.0%	2.5%	5.0%	22.5%
Definitely Deceptive	0	2	2	2	2	2	3	13
	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	7.5%	32.5%
Column Total	0	6	6	8	9	4	7	40
	0.0%	15.0%	15.0%	20.0%	22.5%	10.0%	17.5%	100.0%

Chi Square = 11.98684 with 10 Degrees of Freedom

Significance = 0.2859

Kendall's Tau = 0.05625

Significance = 0.3505

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TABLE 2

RESULTS OF VOICE ANALYZER EXAM

RESULTS OF POLYGRAPH EXAM	Definitely Truthful	Inconclusive	Definitely Deceptive	Row Total
Definitely Truthful	24 17.4%	10 7.2%	27 19.6%	61 44.2%
Inconclusive	11 8.0%	8 5.8%	15 10.9%	34 24.6%
Definitely Deceptive	14 10.1%	7 5.1%	22 15.9%	43 31.2%
Column Total	49 35.5%	25 18.1%	64 46.4%	138 100.0%

Raw Chi Square = 1.49213 With 4 Degrees of Freedom.
 Significance = 0.8280
 Kendall's Tau = 0.05875
 Significance = 0.2224

TABLE 3

RESULTS OF VOICE ANALYZER EXAM

RESULTS OF POLYGRAPH EXAM	Definitely Truthful	Inconclusive	Definitely Deceptive	Row Total
Definitely Truthful	22 18.6%	6 5.1%	23 19.5%	51 43.2%
Inconclusive	10 8.5%	7 5.9%	13 11.0%	30 25.4%
Definitely Deceptive	13 11.0%	7 5.9%	17 14.4%	37 31.4%
Column Total	45 38.1%	20 16.9%	53 44.9%	118 100.0%

Raw Chi Square = 2.24405 With 4 Degrees of Freedom.

Significance = 0.6910

Kendall's Tau = 0.03765

Significance = 0.3255

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TABLE 4

RESULTS OF VOICE ANALYZER EXAM

(Examiner = Dektor Professional)

RESULTS OF POLYGRAPH EXAM	Definitely Truthful	Inconclusive	Definitely Deceptive	Row Total
Definitely Truthful	7 14.6%	3 6.3%	10 20.8%	20 41.7%
Inconclusive	6 12.5%	1 2.1%	6 12.5%	13 27.1%
Definitely Deceptive	7 14.6%	1 2.1%	7 14.6%	15 31.3%
Column Total	20 41.7%	5 10.4%	23 47.9%	48 100.0%

Raw Chi Square = 1.09605 With 4 Degrees of Freedom.

Significance = 0.8949

Kendall's Tau = 0.06304

Significance = 0.3176

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TABLE 5

RESULTS OF VOICE ANALYZER EXAM

(Examiner = Department of Commerce Employee # 1)

RESULTS OF POLYGRAPH EXAM	Definitely Truthful	Inconclusive	Definitely Deceptive	Row Total
	4	5	11	20
Definitely Truthful	9.1%	11.4%	25.0%	45.5%
Inconclusive	1	5	4	10
	2.3%	11.4%	9.1%	22.7%
Definitely Deceptive	0	5	9	14
	0.0%	11.4%	20.5%	31.8%
Column Total	5 11.4%	15 34.1%	24 54.4%	44 100.0%

Raw Chi Square = 4.79024 With 4 Degrees of Freedom.

Significance = 0.3095

Kendall's Tau = 0.11933

Significance = 0.1954

Virginia PSE Report

TABLE 6

RESULTS OF VOICE ANALYZER EXAM

(Examiner = Department of Commerce Employee # 2)

RESULTS OF POLYGRAPH EXAM	Definitely Truthful	Inconclusive	Definitely Deceptive	Row Total
Definitely Truthful	13 28.3%	2 4.3%	6 13.0%	21 45.7%
Inconclusive	4 8.7%	2 4.3%	5 10.9%	11 23.9%
Definitely Deceptive	7 15.2%	1 2.2%	6 13.0%	14 30.4%
Column Total	24 52.2%	5 10.9%	17 37.0%	46 100.0%

Raw Chi Square = 2.42216 With 4 Degrees of Freedom.
 Significance = 0.6586
 Kendall's Tau = 0.13020
 Significance = 0.1691

Virginia PSE Report

TABLE 7

RESULTS OF VOICE ANALYZER

(Examiner = Department of Commerce Employee # 1)

RESULTS OF VOICE ANALYZER

(Examiner =
Dektor Pro-
fessional

	Definitely Truthful	Inconclusive	Definitely Deceptive	Row Total
Definitely Truthful	0 0.0%	9 21.4%	8 19.0%	17 40.5%
Inconclusive	2 4.8%	2 4.8%	1 2.4%	5 11.9%
Definitely Deceptive	3 7.1%	3 7.1%	14 33.3%	20 47.6%
Column Total	5 11.9%	14 33.3%	23 54.8%	42 100.0%

Raw Chi Square =11.67967 With 4 Degrees of Freedom.

Significance = 0.0199

Kendall's Tau = 0.11630

Significance = 0.2101

TABLE 8

RESULTS OF VOICE ANALYZER

(Examiner = Department of Commerce Employee # 2)

RESULTS OF
VOICE ANALYZER
(Examiner =
Dektor Pro-
fessional

	Definitely Truthful	Inconclusive	Definitely Deceptive	Row Total
Definitely Truthful	9 20.9%	2 4.7%	6 14.0%	17 39.5%
Inconclusive	3 7.0%	0 0.0%	2 4.7%	5 11.6%
Definitely Deceptive	9 20.9%	3 7.0%	9 20.9%	21 48.8%
Column Total	21 48.8%	5 11.6%	17 39.5%	43 100.0%

Raw Chi Square = 1.18545 With 4 Degrees of Freedom.

Significance = 0.8805

Kendall's Tau = 0.08410

Significance = 0.2777

TABLE 9

RESULTS OF VOICE ANALYZER

(Examiner = Department of Commerce Employee # 2)

RESULTS OF
VOICE ANALYZER

(Examiner =

Dept. of Com-
merce Employee

	Definitely Truthful	Inconclusive	Definitely Deceptive	Row Total
Definitely Truthful	3 7.3%	1 2.4%	1 2.4%	5 12.2%
Inconclusive	8 19.5%	0 0.0%	5 12.2%	13 31.7%
Definitely Deceptive	9 22.0%	4 9.8%	10 24.4%	23 56.1%
Column Total	20 48.8%	5 12.2%	16 39.0%	41 100.0%

Raw Chi Square = 3.92791 With 4 Degrees of Freedom.

Significance = 0.4159

Kendall's Tau = 0.16551

Significance = 0.1284

Virginia PSE Report

TABLE 10
INDIVIDUAL RESULTS

Case	Polygraph Results	Voice Analyst Number One	Voice Analyst Number Two	Voice Analyst Number Three
1	Inconclusive	Truthful	Inconclusive	Deceptive
2	Inconclusive	Deceptive	Deceptive	Inconclusive
3	Deceptive	Deceptive	Deceptive	Deceptive
4	Deceptive	Deceptive	Inconclusive	Truthful
5	Deceptive	Inconclusive	Deceptive	Deceptive
6	Truthful	Not Rated	Not Rated	Truthful
7	Deceptive	Truthful	Inconclusive	Not Rated
8	Truthful	Inconclusive	Truthful	Truthful
9	Inconclusive	Truthful	Inconclusive	Truthful
10	Inconclusive	Deceptive	Not Rated	Not Rated
11	Truthful	Truthful	Inconclusive	Deceptive
12	Truthful	Not Rated	Inconclusive	Truthful
13	Truthful	Truthful	Deceptive	Deceptive
14	Truthful	Deceptive	Deceptive	Truthful
15	Truthful	Truthful	Not Rated	Not Rated
16	Inconclusive	Deceptive	Inconclusive	Truthful
17	Truthful	Truthful	Not Rated	Truthful
18	Deceptive	Deceptive	Deceptive	Inconclusive
19	Truthful	Deceptive	Truthful	Deceptive
20	Inconclusive	Truthful	Inconclusive	Not Rated
21	Truthful	Deceptive	Deceptive	Deceptive
22	Truthful	Inconclusive	Inconclusive	Deceptive
23	Inconclusive	Deceptive	Deceptive	Deceptive
24	Deceptive	Truthful	Inconclusive	Truthful
25	Truthful	Deceptive	Truthful	Truthful
26	Deceptive	Truthful	Deceptive	Inconclusive
27	Deceptive	Deceptive	Deceptive	Deceptive
28	Inconclusive	Truthful	Inconclusive	Deceptive
29	Deceptive	Truthful	Inconclusive	Truthful
30	Truthful	Truthful	Inconclusive	Truthful
31	Truthful	Inconclusive	Inconclusive	Truthful
32	Truthful	Deceptive	Deceptive	Truthful
33	Truthful	Truthful	Deceptive	Truthful
34	Inconclusive	Truthful	Deceptive	Inconclusive
35	Truthful	Deceptive	Truthful	Inconclusive
36	Deceptive	Truthful	Deceptive	Truthful
37	Deceptive	Truthful	Deceptive	Truthful
38	Truthful	Deceptive	Deceptive	Truthful
39	Inconclusive	Truthful	Not Rated	Deceptive
40	Deceptive	Deceptive	Not Rated	Truthful
41	Deceptive	Deceptive	Inconclusive	Deceptive
42	Deceptive	Deceptive	Deceptive	Truthful
43	Inconclusive	Inconclusive	Truthful	Truthful
44	Inconclusive	Deceptive	Not Rated	Not Rated
45	Deceptive	Truthful	Deceptive	Deceptive
46	Deceptive	Deceptive	Deceptive	Deceptive
47	Truthful	Deceptive	Deceptive	Truthful
48	Inconclusive	Deceptive	Deceptive	Deceptive
49	Truthful	Deceptive	Deceptive	Deceptive
50	Truthful	Truthful	Deceptive	Truthful

B

A Validity Study of the Psychological Stress Evaluator

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JAN 22 1976

Brian E. Lynch and Donald R. Henry
Royal Ottawa Hospital, Ottawa, Ontario

FIRE MARSHAL BUREAU

The Psychological Stress Evaluator (PSE) was assessed for its ability to display and detect arousal in the spoken word. Forty-three university summer students were asked to read aloud 10 words composed of random proportions of taboo and neutral words. PSE recordings of these words were then given to 2 trained and 10 untrained analysts for identification of stress patterns. Results indicated that, although the students rated the taboo words significantly more arousing than the neutral, the accuracy of identification of such words was no greater than chance for all analysts, regardless of training. It was concluded that the PSE may not be as effective as its manufacturers claim. Additional research appears warranted.

The Dektor Corporation of Springfield, Virginia has marketed an instrument called the Psychological Stress Evaluator (PSE) which is claimed to measure stress, arousal, or physiological change associated with the voice, without the need of attached sensors. Traditionally, physiological measurement has used attached sensors with the result that a certain percentage of the measured arousal is artificially induced. If one is attempting to measure the degree of arousal or physiological change associated with a specific stimulus, then measurement without sensors would eliminate the possibility of sensor-induced arousal.

The PSE employs tape-recorded speech for the purpose of voice analysis. Briefly, the system involves feeding recorded vocalizations into the PSE to produce a visually observable medium. This medium or wave form is carefully analyzed in an attempt to identify frequency components of the recorded utterances that indicate physiological manifestations of psychological stress. More specifically, the PSE is intended to record the frequency components of uttered speech in such a way that purported infrasonic variations become indicators of the degree of stress. The Dektor Corporation suggests that these infrasonic variations are muscle microtremors occurring at 8-12 Hz (Lippold, 1971), and that the resultant patterns can be analyzed for stress using various modes (electronic filtering) and tape speeds.

PSE voice analysis has been researched in various ways. Barland (Note 1), Kradz (Note 2), Kubis (1974), and Vetter (1973) have used the PSE in the

¹Dektor Counterintelligence & Security, Inc., 5508 Port Royal Rd., Springfield, Virginia, U.S.A.

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detection of deception, using mock and real crime situations. Borgen and Goodman (Note 3), Brenner (Note 4), Reeves (1976), Smith (Note 5), Wiggins, McCranie, and Bailey (1975), and Worth and Lewis (1975) have used the PSE in various experimental situations, ranging from psychotherapeutic effectiveness to stage fright. Podlesny and Raskin (1977) state that "at this point there appears to be no scientific evidence that PSE analysis yields accuracies as high as those obtained with standard polygraph procedures, and little evidence that results exceed chance levels" (p. 796).

Much of the research presently available on the PSE has lacked external truth criteria for validation requirement and also aid in the analysis. Emotionally powered words have been used in various physiological investigations as reliable laboratory inducers of mild stress (Stelmack & Leckett, 1974). The purpose of the present study was (a) to investigate the validity and inter-judge agreement of the PSE by assessing the rate of detection of arousal in spoken words; and (b) to see if naive analysts could analyze stress by matching to sample.

Method

Subjects

The sample consisted of 43 university summer students ranging in age from 18 to 50, with a mean age of 26.1 years. There were 21 males and 22 females, representing a cross-section of socio-economic levels in a bilingual university environment. Because of the design utilized, all students constituted the experimental group without the necessity of a control group.

Apparatus

The stimuli consisted of 10 neutral words (at, by, cup, home, on, or, over, run, sky, the) and 10 taboo words (cock, cunt, fag, frig, fuck, prick, puke, screw, shit, tit; cf. Stelmack & Leckett, 1974), printed on a 7.5 x 12.5 cm cards with 20-pt Helvetica medium (capitalized) Letraset lettering. An additional neutral word (pen) was added as an initiating "damper" stimulus. Voice recording was taken on a Uher 4000 report I-C tape recorder using a Uher dynamic microphone M 136 and Scotch AV-177 low-noise tape. The tape recording was subsequently played into the Psychological Stress Evaluator (PSE-101) at speeds of either 4.7 cm/sec or 2/4 cm/sec. and filtered through Mode III.

Procedure

Before the experiment, all students completed the Eysenck Personality Inventory (EPI). Each student was then given a stack of 10 randomly arranged neutral and taboo word cards, plus the initiating neutral words. The random order was accomplished by blindly drawing each set of 10 cards from a box containing all 20 cards. Each student was asked to recite the words into the tape recorder after the experimenter had left the room. When finished, each student was asked to rate the 10 words on a 7-point rating scale, ranging from very pleasant to very disgusting. All recorded word lists were then processed on the PSE and distributed to 2 trained analysts

and 10 untrained analysts for stress analysis. All raters used a rating chart composed of voice patterns identified by the Dektor Corporation (Note 6) as indicative of stress. None of the raters was aware of the type of words, or the proportion of neutral to taboo words. They were instructed only to compare the 430 word patterns and the rating charts to see if any of the patterns were similar.

Results

Table 1 presents the decisions made by each of the analysts on the 430 voice patterns, of which 216 were taboo words and 214 were neutral words. There were no statistically significant differences between the analysts on accuracy of rating ($t(11) = .62$, p greater than .05). Both trained and untrained analysts were unable to discern differences in voice patterns between taboo and neutral words. That is to say, they were unable to sort the voice-stress patterns consistently, at a greater than chance level, into those that belonged with taboo words and those that belonged with neutral words.

In addition, there was no relationship between the analysts' pattern identifications and their resultant accuracies ($r = -.01$, biserial coefficient). Thus the total number of stress pattern identifications was not a predictor of accuracy outcome. The mean EPI results were within normal limits for university students ($E = 11.2$, $N = 10.4$, $L = 3.3$). There were no significant correlations between word ratings and any of the EPI scales. There was a statistically significant difference between the student's rating of taboo words and neutral words ($t(42) = 5.78$, p less than .001).

TABLE 1
Breakdown of percentages in stress pattern identification

Analyst	Taboo words		Neutral words		Stress and neutral
	"Stress" (%) (True-Positive)	"No stress" (%) (False-Negative)	"Stress" (%) (False-Positive)	"No stress" (%) (True-Negative)	Correctly identified (%)
1. T*	41	59	51	49	45
2. T	67	33	78	22	45
3. UT*	15	85	15	85	50
4. UT	92	8	92	8	50
5. UT	64	36	57	43	54
6. UT	69	31	67	33	51
7. UT	75	25	86	14	44
8. UT	77	23	69	31	54
9. UT	84	16	87	13	49
10. UT	98	2	96	4	51
11. UT	87	13	88	12	50
12. UT	1	99	0	100	50
TOTAL	64	36	65	35	49 t .62 ns

*T = trained.

*UT = untrained.

Discussion

These results indicate that pattern identification of voice stress resulting from the utterance of taboo and neutral words was a chance occurrence. The analysts, regardless of training, performed at approximately chance levels in terms of accuracy of identification. Therefore, accuracy of pattern identification was not a function of extent of training in pattern identification. Since both trained and untrained analysts followed no consistent trend in identifying words, it must be concluded that pattern identification in this study was accomplished by random guessing. That is, the analysts were in no way consistent in their choice of patterns and, therefore, in their resultant accuracy.

The lack of significant difference between the actual accuracy rate and the expected accuracy rate may reflect, in part, a state of low level arousal when subjects uttered taboo words. Although the students rated the taboo words as significantly more disturbing than the neutral, the taboo words may still not have been sufficiently arousing to be picked up by the PSE. Since earlier studies have shown taboo words to be arousing, this explanation does not seem compelling. However, the inventors of the PSE (Note 7) suggest that it functions within limits of arousal which have not yet been defined. Thus, a certain level of arousal must be present in an individual in order for it to be picked up and displayed by the PSE. If this is the case, usage of such equipment in applied situations would require some external criterion measure of "sufficient arousal" before anything could be said about the voice pattern. With reference to the present study, if the uttered words were not registering on the PSE, then this would preclude any chance of correct identification by the stress analysts.

Many questions as to pattern identification, training effect, and minimum-maximum stress levels necessary with the PSE, are still unanswered. It is well known that the PSE is being used by police and private industry daily as a procedure for detecting deception. If, because of threshold activation limits, it cannot detect stress states equally on a continuum from no stress to maximum stress, then when and when not to use it without some other criterion measure of arousal is an unanswered question. If, as its inventors claim, the PSE has been effective in stress identification, it is probable that the strong placebo effect of such an instrument has been the chief factor behind any significant accuracy results.

A situation is needed which very clearly causes physiological arousal, and does not rely simply upon an individual's self report of arousal. Since polygraphic measure have been used as indicators of various physiological parameters (Crossman, 1967), it seems feasible to use them as criteria of physiological arousal. A future study might investigate the PSE in comparison with other physiological measures, to establish if it is dependent on some minimal level of stress in order to be effective.

Reference Notes

1. Barland, G.H. Use of voice changes in the detection of deception. Paper presented at the meeting of the Acoustical Society of America, Los Angeles, October 1973.

JAN 22 1985

THE PSYCHOLOGICAL STRESS EVALUATOR
TECHNICAL LIMITATIONS AFFECTING LIE DETECTION

FIRE MARSHAL BUREAU

By

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And

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Our testimony concerns technical limitations in the Psychological Stress Evaluator (PSE), the original and most widespread of the recent lie detection devices which employ analysis of the human voice. Based on our research experience with this device, we believe that the PSE measure is not of sufficient technical quality to be used in lie detection and our testimony documents five technical shortcomings which affect the present instrument. This evidence on technical quality is especially relevant to lie detection in employment situations, since such lie detection evidence may be used as the sole basis for serious, uncontestable, and final decisions. Evidence on technical quality is also relevant to the issues of Constitutional rights which apply to voice lie detectors because of the possibility of testing subjects without their knowledge.

We do not believe that all aspects of PSE analysis are invalid. Several reports provide evidence that the PSE may be valid as a measure of psychological stress (1, 2). The rationale of PSE operation (involving stress-sensitive frequency modulation in the voice) is consistent with earlier acoustical evidence (3). However, there is a large difference between a preliminary measure of stress and a finished instrument which can be applied in an area as complex as lie detection. Detection of deception would be subject to controversy even if it employed an ideal measure of stress (4). Using a measure subject to serious technical limitations on reliability lie detection becomes extremely questionable. Our testimony concerns such limitations in the PSE.

The original research reported here was carried out at Harvard University as well as the universities of our affiliations. Specifically, it concerns five technical limitations.

1) Subjectivity of Scoring

PSE scoring is highly subjective and scores assigned to particular PSE patterns depend largely on the particular judge doing the scoring.

This paper is reprinted, with updating and minor changes, from testimony presented at hearings on Senate Bill 1845, United States Senate, Subcommittee on the Constitution, Committee on Judiciary, September 19, 1978. For copies of reprints write to Dr. Malcolm Brenner, Ames Research Center LM 239-2, National Aeronautics and Space Administration, Moffet Field, California 94035.

A mathematical estimate of scoring subjectivity is available in the interjudge reliability coefficient (r), which summarizes the degree of overlap present in the scores provided by two different judges who have scored the same material. This reliability coefficient ranges in value from $r = .00$ to $r = 1.00$, with the magnitude of the coefficient directly reflecting the degree of overlap present. Most psychologists would consider an interjudge reliability coefficient of $r = .80$ as the minimum requirement for any serious assessment instrument.

Interjudge reliability coefficients for PSE scoring, however, are typically lower than $r = .80$. Horvath(5) reports a coefficient value of $r = .38$, and Worth & Lewis(6) of $r = .56$, for material drawn from laboratory lie detection tasks, Older & Jenney(7) report a coefficient of $r = .39$, Lewis & Worth(8) of $r = .54$, and Rockwell, Hodgson, & Cook(9) of $r = .89$ for material drawn from tasks other than lie detection. These interjudge coefficients, the only values reported by independent investigators, suggest serious reliability problems. An example of these problems is provided by a hypothetical example of two judges scoring PSE patterns in two categories: High-stress and Low-stress. Given Worth & Lewis' coefficient value of $r = .56$ (the highest value reported for a lie detection task), these judges would be expected to disagree with each other at least 22% of the time(10).

2) Response Words

PSE scores vary systematically according to the exact words spoken by the subject, and, presumable, the exact linguistic properties of individual words.

Figure 1 demonstrates this effect, and summarizes data for sixteen subjects who performed a mental arithmetic experiment(3) (1034-1038 spoken responses are summarized in each graph). In the top graph ("repeat" responses) the subjects simply repeated out loud the digits from "0" to "9" in a random order as part of the baseline treatment ("6" was not included because it typically provides a PSE pattern of insufficient length to be scored, a severe example of response word difficulties). The digits "5" and "9" received characteristically high PSE scores, the digit "8" characteristically low scores, and the remaining digits intermediate scores. This robust pattern appeared in the data of every subject tested. This pattern also appears in the lower graph ("Mental Arithmetic Responses"), in a virtually identical order, despite the presence of a strong experimental manipulation based on the difficulty of mental arithmetic problems.* In both graphs, the PSE scoring difference between high response words and low response words is on the order of 2 to 1.

The response-word effect imposes serious problems for any PSE examinations which use unrestricted words or continuous speech. This problem also has direct implications for traditional examinations, especially if it turns out that "Yes" and "No" appear to have different levels of PSE-scored stress.

*Subjects were required to add either +4, +3, +1, or +0 to every digit in a string of digits and report out loud the converted series. The time allowance was held constant for each treatment.

3) Recording Quality

PSE scores tend to vary according to the quality of the available tape recordings.

Evidence is provided by Older & Jenney(7). They prepared, under NASA contract, an analysis using PSE scores for stress changes in the voices of SkyLab Astronauts as a function of varying work load demands (2040 spoken utterances were included in the analysis). The available tape recordings varied considerably in quality, and were subjectively grouped into classifications of "good", "fair" or "poor". On a 1 - 5 point scale used to score PSE, Older & Jenney report a difference of about 12% in the final PSE scores as a direct function of available tape quality (pp. 37-39). "Good" recordings showed the highest average stress, and "poor" recordings the lowest.

An interesting sidelight of the Older & Jenney study is the fact that a large subsample of the data was scored by the Chief Instructor at Dektor, Inc., manufacturer of the PSE (the interjudge reliability coefficient, as noted above, was $r = .39$). Ironically, the Chief Instructor proved to be more influenced by the problem of tape quality than the routine judge. The difference in average PSE scores was 22%.

This tape-quality artifact has direct relevant to interrogation recordings made under field conditions. It is especially relevant to PSE samples transmitted over the telephone, a routine procedure which almost certainly lowers tape quality. A judge using telephone transmitted speech may score a pattern which shows less stress than the one made from the speech originally played into the phone.

4) Transcription Speed

PSE patterns vary according to the speed employed for transcribing material through the device.

To demonstrate this effect, we transcribed 217 vocal responses, drawn from two male and one female subject, at the two speeds most commonly used in PSE analysis: 1 7/3 IPS and 15/16 IPS. PSE scores derived from the two transcriptions proved to be extremely different. Correlation coefficients between the two scorings (computed the same way as correlation coefficients for interjudge reliability) ranged between $r = .43$ and $r = .47$ for each subject. In 8% of the cases (17 cases), a pattern which showed high PSE stress at one speed showed low PSE stress at a different speed.

Transcription speed differences appear to be caused both by the slow responsiveness of the transcribing pen and by changes in the filtering cutoffs employed. This effect is not treated in the company training program, which leaves the choice of transcription speed at the discretion of the interrogator(11).

5) Conscious Control

The vocal responses monitored by the PSE may be subject to conscious control.

Evidence for this possibility surfaced in an attempt to replicate Lykken's guilt knowledge task(3). Fifteen male and five female subjects underwent interrogations based on items of personal information (e.g., "What is your mother's first name?"). The subjects were offered a monetary reward to conceal their correct answers from an interrogator who would subsequently employ a PSE analysis of the subjects' vocal responses. The interrogator read out loud each item followed by six possible answers, and the subject repeated out loud all possible answers.

Lykken reports evidence for this task using Galvanic Skin Response(GSR). He reports that the GSR provided significant detection of guilty knowledge items for 20 subjects out of 20 tested, even though subjects had been offered a monetary reward and were given extensive prior information on the interrogation. The PSE results from our experiment were in direct contrast: 19 subjects out of 20 successfully concealed their correct responses (first-choice calls for these subjects, and distribution of calls, was within the levels expected by chance). Although several interpretations are possible for this difference, one clear possibility is that subjects are able to voluntarily influence their vocal responses in a way in which they are unable to influence Galvanic Skin Response.

The issue of conscious control is perhaps the most serious issue raised in this testimony, since it suggests a basic problem which applies to all voice lie detectors and argues for a burden of proof on all persons who wish to sell voice-related devices for these purposes. Incredibly, none of the opponents of voice lie-detectors have raised this possibility, although the strong conscious influence on voice articulation would seem to make this an obvious issue of concern.

There is now enough technical evidence to seriously question the PSE as a practical lie detection device. Problems of scoring subjectivity alone are sufficiently serious in the available literature to question any specific legal decisions, and in practice these scoring problems are compounded and multiplied by the remaining deleterious effects. These technical problems, it should be noted, may also apply to the more recent Mark II and Hagath Lie Detectors which were not tested in these experiments.

The presence of problems in a new instrument is not surprising, and some of the problems described here for the PSE are typical for acoustical measures. What is surprising is the strength of these effects in a device sold for a process as delicate as lie detection. Detection of deception is an exacting application of stress analysis, and there are serious ethical and constitutional objections to the use of any form of detection of deception even if an instrument were available which was 100% accurate(12). The PSE, by contrast, fails to pass certain minimal standards required of any assessment measure, and is employed by users who are in an inappropriate position to recognize its limitations. It seems incredible that this instrument is presently applied in employment situations, where individuals do not have an opportunity to question the scientific quality of the decisions which may directly affect their employment.

JAN 22 1985

AN EXPERIMENTAL COMPARISON OF THE PSYCHOLOGICAL STRESS
EVALUATOR AND THE GALVANIC SKIN RESPONSE
IN DETECTION OF DECEPTION

By

Frank Horvath
Michigan State University

The Psychological Stress Evaluator (PSE), which is asserted to be a voice-mediated lie detector, and the galvanic skin response (GSR), recorded with a standard field polygraph instrument, were used to detect nonrisk lies about numbered cards concealed by a sample of female ($n = 30$) and male ($n = 30$) college students. Evaluation of response data was subjectively carried out by two trained evaluators; their interrater agreement was .38 for PSE analysis and .92 for GSR evaluation. The hit rates obtained in PSE analysis were at chance levels and were not significantly affected by the sex of the subjects, simultaneous use of both PSE (tape recording) and polygraph apparatus, repeated trials of testing, or evaluator differences. Evaluations based on GSR analysis generally exceeded chance levels; however, hit rates was significantly ($p < .05$) higher in a first trial of testing than in a second trial. These findings were consistent with previous research and do not indicate that the PSE is effective in detecting deception.

The Psychological Stress Evaluator (PSE) is a device that is said to be useful in detecting emotional stress in the voice. According to its manufacturer, Dektor CI/S, Inc., the PSE detects inaudible and involuntary frequency modulations (FM) in the 8-12 Hz region. These frequency modulations, whose strength and pattern are inversely related to the degree of stress in a speaker, are believed to be a result of physiological tremor or microtremor (Lippold, 1971) that accompanies voluntary contraction of the striated muscles involved in vocalization. During nonstressful periods the modulations are under control of the central nervous system. As stress is imposed the autonomic nervous system gains dominance, resulting in a suppression of FM. This suppression, indicative of emotional stress, is displayed by the PSE as a characteristic blocked or rectangular wave form.

The PSE processes voice frequencies, preserved on a normal tape recording, using electronic filtering and frequency discrimination techniques. The stress-related FM patterns, displayed on a moving strip of heat sensitive paper, can

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be processed in four different modes of display (1-4) for either gross or more detailed analysis. And, because the recovery of the FM indicator spontaneously occurs with the removal of the stressing stimulus, stress in either narrative or monosyllabic speech can be evaluated (Dektor, Note 1).

The PSE is primarily marketed as a voice-mediated lie detector, more versatile but no less effective than the traditional polygraph instrument (Dektor, Note 1). To date, that claim has been investigated in only two scientifically acceptable studies. The most recent of these was a study carried out by Barland (1975) to determine the validity of the polygraph and the PSE in detecting deception in suspects involved in actual criminal investigations. In brief, Barland found that the accuracy of each physiological measure recorded with the polygraph instrument exceeded chance levels, whereas the accuracy of the PSE did not.

Barland's (1975) findings were essentially similar to those reported by Kubis (Note 2), who conducted an elaborate but laboratory-based study involving mock crime situations. Kubis found that the hit rate for the PSE was at chance levels, 33%; and the accuracy of judges who evaluated only the behavior of the subjects undergoing testing surpassed that obtained with the PSE. Kubis also reported, however, that the accuracy of PSE analysis on tape recordings made without the simultaneous use of polygraphic apparatus was 53%, whereas accuracy was 19% in analysis of recordings of polygraphically monitored subjects. Kubis hypothesized that the physical discomfort produced by the polygraph's blood pressure cuff, actually an occluding plethysmograph, and the absence of stresses associated with the attachment of polygraph apparatus, produced clearer voice records and thus more accurate PSE evaluations.

The purpose of the present study was to investigate the validity of the PSE in a "guilty-information" paradigm (Gustafson & Orne, 1964), and specifically, within that context, to determine if, as Kubis (Note 2) hypothesized, the simultaneous use of polygraph and tape recording apparatus reduces the effectiveness of PSE analysis. Moreover, because the physical discomfort of the polygraph's blood pressure cuff increases as a function of time (Yankee, 1965), it was expected that the validity of the PSE would decrease in a second testing period immediately following a first. The galvanic skin response (GSR) was used as the physiological measure against which the accuracy of the PSE was compared.

Method

Subjects

Sixty college students, 30 female and 30 male, were recruited for an experiment in lie detection from an introductory course in criminal justice. Upon volunteering, each student completed an informed consent form that briefly outlined the nature of the experiment and promised that each student would be awarded extra credit toward his course grade for his participation, contingent only upon maintaining a scheduled appointment and completing the task.

The age range for the female subjects was from 18 to 21 years, with a mean age of 19.2 years; for the males the age range was from 18 to 31 years, with a mean age of 19.9. None of the subjects had previously participated in a detection of deception experiment.

Procedure

Twenty subjects, 10 female and 10 male, were randomly assigned to one of three conditions. Subjects assigned to the "tape only" condition were tested using tape recording apparatus only. A Uher 4000 Report-IC monophonic tape recorder, operating at 7.5 in. per sec (ips), fresh 1-mil polyester tape, and a Sony omnidirectional microphone, positioned in front of the subject, were used for recording. In the remaining two conditions, testing was carried out simultaneously using tape recording and polygraph apparatus. The polygraph was a standard Stoelting field instrument, recording respiration, GSR, and cardiovascular activity. Respiration was recorded by a pneumatic tube positioned on the abdomen near the level of the diaphragm, adjusted to provide a pen excursion of 1-3 cm. GSR was recorded from two stainless-steel electrodes, attached without electrolyte to the volar surfaces of the index and fourth fingers of subjects' left hand; in all cases GSR was recorded in the automatic centering mode; that mode employs a short-time constant measurement technique that eliminates information concerning response recovery time. Cardiovascular activity was recorded by an occlusive blood pressure cuff located on the upper part of subjects' right arm. The cuff was inflated to a pressure of about 90-mm Hg to record cardiovascular activity in a manner consistent with standard field practice (Reid & Inbau, 1977).

In the "tape without cardio" condition, the polygraph's blood pressure cuff was attached to the subject but was not inflated; hence, for those subjects who were assigned to that condition no discomfort was produced by the cuff and no cardiovascular activity was recorded. Subjects who were assigned to the "tape and cardio" condition were tested with a fully operational polygraph, recording the three physiological measures as previously described.

Upon reporting for the experiment, each subject was met by an assistant who carried out the testing in a small, quiet, private office. The assistant initially conducted an interview lasting about 30 min during which he gathered brief background information, explained the nature of the testing apparatus, and the theory of detection of deception. To those subjects who were assigned to the two testing conditions in which the polygraph instrument was to be used, he gave a short demonstration of that apparatus. He then explained the testing procedure, and when assured that each subject understood the procedure, he operationalized the appropriate apparatus and carried out the testing.

The testing procedure, which was identical for all subjects except for the apparatus used, consisted of presenting to each subject a deck of five numbered cards face down. The subject chose one of the cards, looked at the number on it, and then, out of view of the assistant, wrote the number and his name on a small slip of paper; he then placed both the card and the paper slip face down in front of him. At no time prior to the completion of the testing was the assistant aware of the card number a subject had chosen.

The testing consisted of asking the basic question "Did you pick card number ____?" in two consecutive continuous trials. The subject was instructed to answer no to each card number during each trial and to sit motionless with his eyes closed throughout the testing. In the first trial the card numbers were called in ascending sequence, preceded and followed by a buffer number, that is, a number known not to be in the deck. Immediately following the

second buffer item the subject was asked a pivotal question, "Is your first name _____?", to which a yes response was required. A second trial was then conducted; in this trial the card numbers asked in the first trial were called in reverse order. During both trials, card numbers were called at about 20-sec intervals. All subjects had advance knowledge that in the first trial card numbers were to be called in ascending sequence; in the second, descending. The numbers, however, were not consecutive, and subjects were aware only of the number on their chosen card.

Upon completion of the testing, the assistant noted on the polygraph charts, when appropriate, and on the tape recording an identification code number for each subject. Then, the polygraph charts were prepared for evaluation by cutting each subject's charts into two halves, one half consisting of Trial 1, one half of Trial 2; each half was then coded in such a manner that the two halves could not be matched without knowledge of the coding scheme.

From the tape recordings, PSE charts were made by charting each subject's no responses to the card options separately for Trial 1 and Trial 2. The charts for each trial were then coded in a manner to prevent matching. All PSE charts were made on a PSE-101 in Mode 3 at a constant speed reduction of 4:1; that is, PSE charts were produced by playing back subjects' verbal responses at 1 7/8 ips.

Two trained and experienced field polygraph examiners, both also having been trained in the use of the PSE by the manufacturer, independently and subjectively evaluated the PSE and the polygraph charts in a blind manner. In the evaluation of the PSE charts, each of the five possible options in each trial was ranked from 1 to 5, 1 being assigned to the option believed to be the chosen card, that is, the response indicating the greatest stress (least FM) according to criteria taught by the manufacturer, and 5 being assigned to the option indicating the least stress. The polygraph charts were ranked in a manner identical to that carried out on the PSE charts, except that in this case each recorded physiological measure was separately ranked. Although only the GSR rankings were analyzed, it is necessary to point out that those rankings were not necessarily independent of other polygraphically recorded data. Because of such possible contamination, GSR responses were also objectively scored. An assistant, without any prior knowledge of the experiment, ranked each GSR response in each trial for each subject by assigning a rank of 1 to the response attaining the greatest millimeters of amplitude in the period starting with stimulus onset to 15 sec following stimulus offset. The response with the second greatest amplitude was assigned a rank of 2 and so forth; in the case of ties, mean ranks were assigned.

The rank assigned by each evaluator to the card option actually chosen by each subject was determined. If the chosen card was assigned a rank of 1, it was considered a correct detection, while if it was more than 1 it was considered as incorrect. Thus, each evaluator's rank on the card actually chosen by each subject was dichotomously scored, a 1 being assigned to a correct detection, a 0 to an incorrect detection. Unless specified otherwise, statistical analysis was carried out by subjected evaluators' dichotomous scores to a four-way analysis of variance with repeated measures. The four factors were testing condition (tape, tape without cardio, tape and cardio); sex (female, male); trials (1 and 2); and evaluators (A and B). The latter two factors were treated as repeated measures. All statistical testing employed a .05 rejection region.

Results

PSE Analysis

The major findings pertaining to the PSE analysis for each evaluator are shown in Table 1, which displays, by testing condition, the mean ranks to subjects' chosen cards (critical items) and the number of correct detections in each trial; smaller mean ranks indicate greater efficiency in detection.

Each evaluator made 60 calls in each of two trials, each trial being independently considered. Application of the decision rule previously specified and disregard for the sex of the subjects and the testing conditions showed that evaluators averaged 24.2% correct calls in Trial 1; in Trial 2 20.8% of the calls were correct. The difference between trials was not significant, $F(1, 54) = 2.5, p > .10$; nor were either of the evaluators' overall hit rates in either trial significantly greater than chance expectancy of 20% (using the chi-square technique). Interevaluator agreement, determined separately for each trial by calculating Pearson's r on the ranks assigned by evaluators to the subjects' chosen cards, was .31 and .45 for Trial one and Trial two, in order. The difference in the detection rates between conditions was not significant, $F(2, 54) = 1.79, p > .10$, and there were no significant effects associated with sex or evaluators. Moreover, as indicated in Table 1, a binomial test of each evaluator's detection rate within testing conditions showed that those rates were not generally above chance levels. Similarly, analysis of variance carried out on evaluators' ranks to critical items failed to disclose any significant effects for testing conditions, $F(2, 54) = .35, p > .10$; trials, $F(1, 54) = .96, p > .10$; or for any of the other factors.

GSR Analysis

Physiological data recorded by polygraph were available, of course, in only two testing conditions; only the findings pertaining to evaluation of GSR are reported here. To determine whether evaluators' subjective judgements of GSR responses were influenced by their inspection of other polygraphically recorded data, evaluators' ranks on subjects' chosen cards were correlated with those assigned by objective measurement. Pearson's r , averaged for the two evaluators, was .76 in Trial 1 and .65 in Trial 2. However, chi-square tests did not reveal any significant differences in the detection rates obtained by objective or subjective methods. Hence, because those two methods yielded similar results and because PSE responses were not objectively scored, only the results pertaining to subjective evaluation of GSR will be reported.

Each evaluator made 40 calls in each of two trials, each trial being independently considered. There was high interevaluator agreement in ranking responses to the chosen cards, Pearson's r being .92 for both Trial 1 and Trial 2. To facilitate comparison to the PSE findings, Table 2 shows each evaluator's mean rank to chosen cards and number of correct detections in each testing condition and in each trial. In all but the "tape and cardio" condition in the second trial, each evaluator's detection rate was significantly greater than chance expectation (binomial).

THE RELIABILITY OF POLYGRAPH EXAMINER DIAGNOSIS OF TRUTH AND DECEPTION

By

Frank S. Horvath and John E. Reid

Frank S. Horvath is a graduate of Michigan State University with a B.S. Degree in Police Administration. In 1964 following his graduation he pursued the Study of Scientific Polygraph testing at John E. Reid and Associates and became Chief Examiner in 1970. He is licensed as a polygraph examiner in the State of Illinois and is a Charter Member of the American Polygraph Association.

John E. Reid, LLB, DePaul University, Director of John E. Reid and Associates, has made a number of noteworthy contributions to the polygraph field. He is co-author with Professor Fred E. Inbau of Northwestern University Law School of Truth & Deception, The Polygraph (Lie-Detector) Technique and Criminal Interrogation and Confessions 2nd Edition. This is his fourth article to appear in the journal. His previous ones were "Simulated Blood Pressure Responses in Lie Detector Tests and a Method for Their Detection," "A Revised Questioning Technique in Lie-Detector Tests" and "Behavior Symptoms of Lie Detector Subjects."

This study was conducted to determine if Polygraph examiners, working independently of each other, are able to successfully diagnose deception solely from an analysis of Polygraph records. Previous studies dealing with this problem have indicated that Polygraph examiners can reliably determine truth or deception from the records alone, but none of them were conducted in real-life testing situations. Davidson (1968) for example, found that by motivating students involved in an experimental crime he could correctly identify all of the innocent and 92% of the guilty subjects with the use of the Polygraph.[1] Lykken (1959) in a prior experiment, also using students as subjects, reached substantially the same conclusion; he identified all of the innocent and 93.9% of the guilty subjects.[2] Neither of these studies, however, was conducted by or with practicing Polygraph examiners, nor did they rely upon an analysis of Polygraph records obtained in actual investigations. Consequently, the studies have little value in assessing the reliability of Polygraph examiner diagnosis in real-life situations.

Kubis (1962) carried out an elaborate research program for the Air Force Systems Command of the United States Air Force. Although he used a simulated test situation for the experiments, his examiners were trained personnel. He reported that they were able to obtain significant accuracy in identifying the thief, the lookout, and the innocent suspect. He concluded that there was sufficient validity in these experiments to warrant confidence in the lie-detecting procedure as an aid to interrogation processes.[3]

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Diagnosis of Truth & Deception

Ordinarily, in actual Polygraph testing, the examiner uses a complete diagnostic technique to determine deception. He takes into account detailed background information regarding the subject and the investigation; he has the benefit of actually conversing with the subject and observing the subject's attitude and behavior symptoms. In addition, he prepares and reviews the general comprehension of the questions. Since all of these auxiliary sources of information may be factors in arriving at a truth-deception diagnosis, the present study eliminated them and concentrated on Polygraph record analysis only.

In this study ten Polygraph examiners on the staff of John E. Reid and Associates agreed to analyze a number of Polygraph records independently and without the benefit of any information beyond the Polygraph records themselves. Seven of the examiners had been engaged in Polygraph testing more than one year; the remaining three were relatively inexperienced; they had been engaged in Polygraph testing from four to six months and were still participating in an internship training program.

The Polygraph records submitted to the examiners for analysis were obtained from twenty-five case investigations originally conducted by one of the authors (Horvath). The cases were typical of the types usually presented to private Polygraph examiners: theft, sexual misconduct, sabotage, bribery and criminal damage to property. Subsequent to the Polygraph examination each of the selected cases had been solved by a fully corroborated confession of the guilty subject. In these twenty-five cases, seventy-five subjects had been tested originally, but the Polygraph records of only forty of them were selected for the use in this study for the following reason: the polygraph records which were dramatically indicative of truth or deception were eliminated from those submitted to the examiners because they did not require any exceptional skill to interpret. In other words, the evidence of truth and deception would be very obvious to any trained Polygraph examiner.

Twenty of the forty sets of Polygraph records chosen by the writer for this study were verified as those obtained from guilty subjects, and twenty test records were obtained from verified innocent subjects. The records contained one hundred and sixty-four (164) relevant questions which were submitted to the examiners; eighty-one (81) of these questions were verified as having been answered untruthfully during the examinations; eighty-three (83) of the questions were proven to be answered truthfully.

The recording instrument used in conducting the original Polygraph examinations was a five-channel Reid Polygraph which recorded thoracic respiration, abdominal respiration, blood pressure-pulse rate, muscular movements and pressures, and galvanic skin response (GSR). No attempt was made to determine which recording channel or channels the examiners relied upon in arriving at their decisions of truth and deception.

The subjects in each case had been given Polygraph examinations according to standard Reid Control Question Technique.[4] Essentially this technique consists of a pre-test interview and Polygraph testing. During the interview the examiner explains to the subject the purpose of the test and the nature of the instrument. It is at this time that the examiner seeks to condition the subject for the test and to formulate and review

with him the actual test questions. In the pre-test interview the examiner objectively notes the subject's behavior symptoms such as how he acts, looks, and talks and attempts to make an evaluation of these observations in terms of truth or deception. No attempt is made at this time to interrogate the subject with a view to obtaining a confession. At the conclusion of the interview, which lasts about twenty minutes, the examiner proceeds with the Polygraph testing.

The Polygraph testing consists of the asking of relevant, irrelevant and control questions during a number of separate tests. The questions in the 3, 5, 8, 9 and 10 positions are relevant and relate to the matter under investigation, such as, in a murder case, "Did you kill John Jones?" and "Did you shoot John Jones with a .38 caliber revolver?" The questions in the 1, 2, 4 and 7 positions are irrelevant to the issue being investigated; they deal with such matters as, "Do they call you Joe?", "Are you over 21 years of age?", etc. These irrelevant questions are asked for the purpose of establishing the subject's normal pattern of responsiveness. The remaining two questions are control questions. They are placed in the 6 and 11 positions. A control question is one which is unrelated to the matter under investigation, but is of a similar, though less serious nature and one to which the subject will, in all probability, lie; or at least his answer will give him some concern with respect to either its truthfulness or its accuracy. For instance, in a burglary investigation the control question might be, "Did you ever steal anything?" or "Except for what you have already told me, did you ever steal anything else?" The response or lack of response to the control question (in respiration, blood pressure-pulse rate, or GSR) is then compared with what appears in the tracings when the subject is asked the questions relevant to the issue under investigation. If the subject responds to a greater degree and with more consistency during the test series to the control questions than to the relevant questions, he is considered to be telling the truth regarding those relevant questions. On the other hand, if the subject responds more to the relevant questions than to the control questions, it is suggestive of lying regarding the relevant questions.[5]

In about 25 percent of Polygraph cases truth or deception may be so clearly disclosed by the nature of the responses to relevant or control questions that the examiner will be able to point them out to any non-expert and satisfy him of their significance. All records of this category were eliminated from use in this study because they do not constitute a serious test of an examiner's expertise in chart interpretation. In roughly 10 percent of the Polygraph cases the records will be uninterpretable by even the most skilled examiner. In about 65 percent of the cases, however, the responses or lack of responses, to the control questions and relevant questions are sufficiently subtle in appearance and significance so that only a highly skilled and well-trained examiner will be able to interpret them for truth and deception. All of the Polygraph records given to the examiners in this study could be classified as belonging to this category.

The examiners were unfamiliar with either the cases or the Polygraph records which they were called upon to analyze. They were not allowed to discuss the project amongst themselves until all had completed it. They were not given any of the actual test questions used in the original investigations, but because of their familiarity with the technique, each

examiner knew the placement of the irrelevant, relevant, and control questions by their respective numbers as recorded on the records.

The examiners were told on an individual basis that they would be allowed one full working day to analyze the forty sets of Polygraph records. They were instructed to detect the guilty subject, if any, in each investigation and also to "clear" each innocent subject. In addition to this, they were instructed to diagnose truth or deception on each relevant question asked of all forty subjects. They were admonished not to report any subject as totally inconclusive, but if they found in analyzing any particular question reaction that they could not decide truth or deception, they were allowed to report that particular question as doubtful or inconclusive. The reason for this conclusion was that in any given Polygraph examination some of the relevant questions may carry more "emotional weight" than others, even though they all relate to the same investigation. This is especially true in the instance where a guilty person is tested. Often he will respond to a greater degree to a question regarding whether or not he himself committed the offense than he will to a question about whether or not he knows who committed the offense, even though he is lying to both questions asked. The more direct and more emotionally weighted question such as, "Did you shoot John Jones?" sometimes may "mask out" or otherwise "dampen" the response on the indirect or less emotionally weighted questions, such as, "Do you know who did shoot John Jones?"

Prior to being given the Polygraph records, the examiners were told that all subjects were verified as guilty or innocent, but they were not told the number of subjects in each category. More significantly, they were not told whether the Polygraph records of the actual perpetrator were included in each of the cases submitted to them for diagnosis. The examiners were given only basic factual information from each of the twenty-five cases, together with the selected Polygraph records.

The following information, chosen from one of the cases used in this study, is illustrative of the amount and the type of information presented to the project examiners:

"An electric motor was sabotaged at a large midwestern rubber company. It was suspected that one of the company's employees had inserted some knife blades (which were used at the company) into the armature of the motor when it was not running. When it was turned on, the blades caused the motor to "blow up" and produced extensive damage to the surrounding area and almost seriously injured several employees."

The examiners were not told that fourteen employees were given Polygraph examinations before the guilty person was detected in the original investigation. They were supplied with only the brief factual information given above and with the Polygraph records of six of the original fourteen subjects. The six sets of records they were given were those selected from the fourteen as best fitting into the category which requires special skill to interpret. The remaining eight sets of Polygraph records were not given to the examiners. The Polygraph records of the actual perpetrator of this sabotage were not included in the six sets of records given to the examiners for analysis; this fact, however, was withheld from the examiners.

Results

Overall Innocent-Guilty Case Judgments. The ten examiners achieved an average 87.75 percent accuracy in solving the cases, i.e., in correctly detecting the guilty subjects and correctly identifying the innocent subjects. As can be seen from Table 1, however, there was a significant difference between the experienced and the inexperienced examiners. The experienced examiners were successful in 91.4 percent of their diagnoses; the inexperienced in only 79.1 percent.

TABLE 1
DISTRIBUTION OF INNOCENT-GUILTY JUDGMENTS FROM EVALUATING POLYGRAPH RECORDS BY EXAMINERS

	Actually Innocent (20)		Actually Guilty (20)		Percent Correct Judgments
	"Innocent"	"Guilty"	"Innocent"	"Guilty"	
Experienced examiners					
1	19	1	0	20	97.5%
2	18	2	0	20	95.0%
3	19	1	2	18	92.5%
4	19	1	2	18	92.5%
5	18	2	2	18	90.0%
6	20	0	5	15	87.5%
7	18	2	4	16	85.0%
Sub-total	131	9	15	125	91.4%
Inexperienced examiners*					
8	19	1	3	17	90.0%
9	16	4	8	12	70.0%
10	15	5	4	16	77.5%
Sub-total	50	10	15	45	79.19%
Total	181	19	30	170	87.75%

* Less than six months experience.

It should also be noted that the more experienced examiners were quite consistent with each other. Their accuracy scores ranged from a low of 85 percent to a high of 97.5 percent, with five of the seven in this group achieving a 90 percent accuracy or higher. Only one of the three inexperienced examiners achieved the 90 percent accuracy level. The remaining two achieved only a 70 percent and a 77.5 percent score, respectively.

The results also seem to support the belief of most Polygraph examiners that their errors generally favor the guilty subject, i.e., that an examiner is more inclined to report a guilty subject innocent than he is to report an innocent subject guilty.

There was a total of 400 innocent-guilty judgements to be made by the examiners; that is, each of the ten examiners was called upon to judge each of the forty subjects either guilty or innocent. One-half of the judgements were to be made on verified innocent subjects and one-half were to be made on verified guilty subjects; therefore, there were 200 judgements in each category.

Over the 200 judgements of the twenty verified innocent subjects, nineteen (9.5) were erroneously judged "guilty" by the examiners; of the 200 judgements of the twenty verified guilty subjects, thirty (15 percent) were erroneously judged innocent. In analyzing this further, it should be noted that for the seven experienced examiners only nine out of 140 (6.4 percent) judgements on the twenty innocent subjects were errors, while among inexperienced examiners, 16.6 percent of their judgements on verified innocent subjects were errors. For verified guilty subjects, 10.8 percent of the experienced examiner judgements were "innocent" errors, while 25.0 percent of the inexperienced examiner judgements were "innocent" errors.

Individual Relevant Question by Question Analysis

Table 2 summarizes the data for each examiner's performance in correctly interpreting the 164 relevant questions for truth and deception.

Nine of the ten examiners achieved at least a 77.5 percent accuracy rating on the question by question analysis and six of the ten achieved better than 83 percent. Although the experienced examiners again significantly higher than the inexperienced, both groups combined had only an overall error of 20.7 percent. This figure, however, is somewhat misleading, because it includes as errors those relevant questions which the examiners reported as inconclusive or on which they were unable to make any diagnosis. This error was usually made by examiners when they analyzed the Polygraph records of a guilty subject and correctly interpreted the more direct relevant questions, but were unable to interpret an indirect relevant question due to the "masking out" effect described above. If these inconclusive questions errors are eliminated, examiners actually made only an 11 percent error; that is, they judged only 11 percent of the relevant questions opposite their verification, thus achieving an overall 89 percent accuracy rating.

To further illustrate the results of the question analysis, Table 3 indicates how accurately each examiner interpreted the Polygraph records of one of the six subjects in the previously described sabotage case.

The relevant questions asked of all subjects in this case were as follows: Question # 3, "Did you inset two mill knife blades into the armature of that motor?"; Question # 8, "Did you cause that damage to the mill motor?"; Question # 9, "Do you know who put those knife blades in the mill motor?" There was no question asked in #10 position. The irrelevant and control questions were placed according to the format previously explained.

The subject (used as an example in the table) was asked the four relevant questions. Since it had been verified that his answers were truthful to all questions, his records should have been analyzed by the examiners as being those of an "innocent" subject and as consisting of four truthful relevant question responses. Only examiners 1, 2, 3, 4, 6, and 9 judged the subject in this manner. Examiners 7, 8 and 10 judged this subject as "guilty" and the four relevant question reactions as "lies." Examiner 5 judged this subject as innocent by finding him telling the truth to Questions # 3, # 5 and # 8, but recorded him as inconclusive on Question # 9. (knowledge question) This was recorded as an error.

TABLE 2
DISTRIBUTION OF TRUE-LIE JUDGMENTS OF EXAMINEE RESPONSES TO 164 QUESTIONS BY EXAMINERS

Examiner Judgment	Actually True Response (83 true responses)			Actually Lie Response (81 lie responses)			Percent Correct Judgments
	"True"	"?"	"Lie"	"True"	"?"	"Lie"	
Experienced examiners							
1	79	0	4	0	1	80	96.6%
2	74	0	9	3	0	78	92.7%
3	77	0	6	14	0	67	87.6%
4	75	3	5	8	7	66	86.0%
5	64	18	1	7	11	63	77.5%
6	60	0	23	0	0	81	86.0%
7	65	11	7	14	5	62	77.5%
Sub-total	494	32	55	46	24	497	86.2%
Inexperienced examiners*							
8	71	4	8	12	13	56	77.5%
9	60	15	8	24	11	46	64.6%
10	61	13	9	19	2	60	83.8%
Sub-total	192	32	25	55	26	162	75.0%
Total	686	64	80	101	50	659	79.3%

* Examiners with less than six months experience.

TABLE 3
EXAMINER JUDGMENTS OF THE RESPONSES OF ONE INNOCENT AND TRUTHFUL SUBJECT TO FOUR RELEVANT QUESTIONS

	Relevant Question Number				Overall Judgment
	#3	#5	#8	#9	
Experienced examiners					
1	Truthful	Truthful	Truthful	Truthful	Innocent
2	Truthful	Truthful	Truthful	Truthful	Innocent
3	Truthful	Truthful	Truthful	Truthful	Innocent
4	Truthful	Truthful	Truthful	Truthful	Innocent
5	Truthful	Truthful	Truthful	Inconclusive	Innocent, but guilty knowledge
6	Truthful	Truthful	Truthful	Truthful	Innocent
7	Not truthful	Not truthful	Not truthful	Not truthful	Guilty
Inexperienced examiners*					
8	Not truthful	Not truthful	Not truthful	Not truthful	Guilty
9	Truthful	Truthful	Truthful	Truthful	Innocent
10	Not truthful	Not truthful	Not truthful	Not truthful	Guilty

* Examiners with less than six months experience.

inexperienced, both groups combined had only an overall error of 20.7 percent. This figure, however, is somewhat misleading, because it includes as errors those relevant questions which the exami-

ners reported as inconclusive or on which they were unable to make any diagnosis. This error was usually made by examiners when they analyzed the Polygraph records of a guilty subject and cor-

Diagnosis of Truth & Deception

Discussion

These data clearly support the claim of Polygraph examiners that they can reliably diagnose truth and deception or detect the guilty and identify the innocent solely from an analysis of Polygraph records. In actual practice, of course, a Polygraph examiner has the benefit of all the detailed factual information in the case beforehand, as well as the behavior symptoms of the subject at the time of the test and moreover in many case situations he has the full complement of Polygraph records of all the subjects in the case before he issues an opinion as to whether the subject is truthful or not. In actual testing situations the examiner places the utmost reliance upon responses or lack of responses on Polygraph records, but he is afforded the additional opportunity to evaluate the attitude of the subject and to make allowances for a resentful or angry attitude, a condition which could cause an error in interpretation of Polygraph records. An opportunity to observe the subject and evaluate his attitude toward the test would allow an examiner to diagnose truth and deception more reliably than the examiners in this study.

If the examiner had been given all of the Polygraph records in each case and were aware of the fact that one of the subjects must be guilty, the accuracy ratings for both experienced and inexperienced examiners would have been greatly improved. This would have allowed for the examiners to compare the Polygraph records of one subject with those of another subject in the same investigation.

Although the results of the present study attest to the reliability of Polygraph examiner's ability to diagnose truth and deception, they also attest to the value of practical experience in qualifying examiners as experts. The accuracy of the experienced examiners was significantly better than that of the inexperienced examiners. This was probably due to the fact that the experienced examiners had more practical knowledge of the limitations of the Polygraph technique in that both groups of examiners had been taught the "theory" of the technique in the same manner. The examiners with the most experience were more able to apply consistently the fine points of the theory, which assisted them in diagnosing truth and deception with greater accuracy.

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Footnotes

[1] Davidson, P.O. "Validity of the Guilty Knowledge Technique: The Effects of Motivation." 52 J. Appl. Psychol., 62-65 (1968).

[2] Lykken, D.T. "The GSR in the Detection of Guilt." 43 J. Appl. Psychol., 385-388 (1959).

[3] Kubis, J.F. Study in Lie Detection, Computer Feasibility Consideration. Griffin Air Force Base, New York: Rome Air Development Center, Air Force Systems Command, United States Air Force, 1962.

[4] Reid, John E. "A Revised Questioning Technique in Lie-Detector Test." 37 J. Crim. L.C. & P.C. 542 (1947). Truth and Deception: The Polygraph (Lie-Detector) Technique, 27-32 (1966).

[5] The two previous paragraphs are excerpts from "The Lie Detector Technique: A Reliable and Valuable Investigative Aid." Inbau, F.E. and Reid, J.E., 50 A.B.A.V. (5)(1964).

* * * * *

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The examiner conducted both examinations and testified that the defendant was telling the truth when he denied having sexual relations with the plaintiff during the 1971 period, and that the plaintiff was deceptive when she claimed that they did have intercourse, and was also deceptive when she claimed that she did not have intercourse with other men during that period.

The plaintiff then objected to the admissibility of the testimony, but was overruled. The Judge decided that the defendant was not the father of the child, and said that in the main his finding was based on the results of the polygraph tests.

People v. Olmas, Juvenile Division, San Joaquin County Superior Court (1974)

Two juvenile defendants were charged with rape, robbery and kidnapping.

During the course of the trial the judge, over the objection of the prosecution, admitted into evidence the results of the polygraph examinations of the two defendants given by an examiner employed by the San Joaquin County Public Defenders Office.

The court asked the examiner if a polygraph examination had been given to the victim. The prosecution interrupted and said she had been given a test, but the examiner said no, that she had been given only a P.S.E. test, and the prosecution said that was true and claimed that they did not have time to give her a polygraph test. The court said the P.S.E. was not a polygraph and ordered that the victim be given a polygraph examination. An examiner selected by the prosecutor's office gave her an examination and testified that she was truthful on one chart and the results of the second chart were inconclusive. The court then dismissed all charges.

Opinion of the Attorney General of Alabama, October 23, 1973

In reply to a request of the State Board of Polygraph Examiners, the Attorney General of Alabama ruled on the use of a Dektor Psychological Stress Evaluator.

The Attorney General ruled that a person administering an examination with the Dektor Psychological Stress Evaluator falls within the licensing requirement act; but also ruled that "Since the Dektor PSR-1 does not record cardiovascular or respiratory patterns, it does not meet the minimum instrumentation requirement. Section 6(6) of the Polygraph Examiners Act makes it unlawful to administer Polygraph Examinations utilizing any device or instrumentation which does not comply with Section 3 of the act."

Paz v. Board of Polygraph Examiners, 371 So.2d 415 (1979)

Appellant, Ralph Barletta Paz, was denied a license by the Mississippi Board of Polygraph Examiners because he was a PSE operator, and not a polygraph examiner.

In the Circuit Court of Jackson County Paz sought to have part of the licensing statute struck as unconstitutionally vague, arbitrary, and discriminatory. The Court stated that the statute, Mississippi Code 1972, sections 73-29-5, is not unconstitutionally vague, arbitrary, or discriminatory on its face or in its application. The Court affirmed the order of the Board of Polygraph Examiners in denying a license to appellant Paz.

The Supreme Court of Mississippi considered the appeal of Paz from the order of the Board of Polygraph Examiners which denied him a license. The Supreme Court of Mississippi held that the order of the Circuit Court of Jackson County was without error, and ordered the adjudgment of that court affirmed.

RECEIVED

JAN 22 1985

FIRE MARSHAL BUREAU

State v. Jenkins, Eighth Judicial Court (1976)

Defendant was charged with murder, and tried before a jury. The defense rested upon a confession, elicited under hypnosis, in which the defendant admitted that he strangled the victim, but said he was forced to do so by one of four Indians who had allegedly forced their way into his vehicle.

The defense had a tape of the confession and had it analyzed by a Psychological Stress Evaluator operator, who concluded that the statement about the Indians was true. Based upon the confession and the P.S.E. conclusion, the defense stipulated to a polygraph examination, following the rules established in State v. Stanislawski, 62 Wisc.2d 730, 216 N.W.2d 8 (1974).

The Court examined the polygraph examiner's qualifications, and permitted him to testify. He testified that the polygraph records indicated that the defendant's statements about the Indians forcing him to commit the murder were untrue. There was no other evidence to impeach the statement of the defendant.

The evidence was admitted. The jury found the defendant guilty of murder in the first degree.

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JAN 22 1985

The Supreme Court's opinion clearly establishes that the PSE alone to detect deception is illegal in Illinois. This also applies to the voice analyzer and any other instrument which does not permanently and simultaneously record the subject's cardiovascular and respiratory patterns. The decision also approves the procedure for training, examining for competency and licensing new examiners.

It is also important to note that the Supreme Court has found that the licensing law is necessary for the protection of the public health, safety and welfare. This should be brought to the attention of the Select Joint Committee on Regulatory Agency Reform which recently held hearings on Sunset Legislation regarding the Detection of Deception Examiners Act. The central issue on Sunset Legislation is whether or not the licensing laws are really needed to protect the public, and the Supreme Court's decision clearly holds that such a need exists here.

The Supreme Court did not address the questions of standing to maintain the suit, adequacy of a remedy at law, vagueness and overbreadth of Section 1 of the Act and the standards for the competency examination required by Section 11 of the Act, but remanded them to the Appellate Court for further consideration. However, I do not believe there is any real danger that the Appellate Court will find against us on those issues. If the Appellate Court had found any merit in the defendant's arguments with respect to those issues, it would have ruled on them the first time around. Also, if the Supreme Court had been impressed by them, it would have said so and brought this litigation to an end. Further, the trial court had carefully considered and rejected each of the defendant's arguments and the Supreme Court took note thereof in stating: "The circuit court, in a cogent and exhaustive memorandum opinion, disagreed with the defendant and on February 8, 1978, denied that motion to dismiss as well as a subsequent motion to dismiss the defendant had filed."

The complete Text of the Opinion is as follows:

Illinois Polygraph Society et al., Appellants v. Anthony Pellicano, Appellee. Docket No. 52905, Agenda 29, September 1980. Entered on record on 1 December 1980.

"Mr. Justice Clark delivered the opinion of the court:

"The plaintiffs, Illinois Polygraph Society, an Illinois not-for-profit corporation, Carl S. Klump, and Richard Needham, brought an injunctive action in the circuit court of Cook County. The plaintiffs sought to enjoin the defendant, Anthony Pellicano, from administering detection-of-deception examinations or from holding himself out as a detection-of-deception examiner since the defendant was not licensed under "An Act to provide for licensing and regulating detection of deception examiners ***" (the Act)(Ill. Rev. Stat. 1975, ch. 38, par. 202-1 et seq., now Ill. Rev. Stat. 1979, ch. 111, par. 2401 et seq.) The defendant filed a motion to dismiss the complaint, alleging that the Act is unconstitutional and that the plaintiffs lacked standing to sue. After a hearing the circuit court denied the motion and certified that there was no just reason to delay an appeal from its order. The appellate court reversed, deciding that section 3 of the Act (Ill. Rev. Stat. 1975, ch. 38, par. 202-3, now Ill. Rev.

Stat. 1979, ch. 111, par. 2403) is special legislation in violation of article IV, section 13, of the 1970 Illinois Constitution. (78 Ill. App. 3d 340). We allowed the plaintiffs' petition for leave to appeal. (73 Ill. 2d R. 315). We reverse.

"From our review of the record, the briefs, and appendices of the parties and the amicus curiae brief of the Attorney General, the following facts emerge.

"The defendant uses a device known as a psychological stress evaluator (PSE) in conducting detection-of-deception examinations. A PSE is an instrument which detects, measures and graphically displays certain stress-related components of the human voice. (A. Moenssens & F. Inbau, Scientific Evidence in Criminal Cases 638 [2d ed. 1978].) A PSE records microtremors or what the manufacturer of one brand calls "guilt-revealing sound variations" in a person's voice which, according to its proponents, enable an examiner to discern the stress a person is under. From that data, an examiner is purportedly able to tell whether a person is telling the truth.

"The allegations in the complaint, which must be taken as true (Collier v. Wagner Castings Co. (1980), 81 Ill. 2d 229, 232), show that the plaintiff, Illinois Polygraph Society, is a not-for-profit corporation whose membership consists of detection-of-deception examiners licensed by the Department of Registration and Education (Department). The individual plaintiffs, Carl S. Klump and Richard S. Needham, are licensed, practicing detection-of-deception examiners. They are also members of the plaintiff Society. The defendant presently conducts examinations using the PSE. He has not applied for, and does not possess a license as a deception-detection examiner as required by the Act (Ill. Rev. Stat. 1975, ch. 38, par. 202-4, now Ill. Rev. Stat. 1979, ch. 111, par. 2404). Nor does the defendant possess an internship license as provided for under the Act (Ill. Rev. Stat. 1975, ch. 38, par. 202-12, now Ill. Rev. Stat. 1979, ch. 111, par. 2413). Further, the complaint alleges that the plaintiffs' and the public's rights are being infringed by defendant's failure to comply with the Act. Also, it is alleged that the governmental officers charged with enforcing the Act have failed to do so against the defendant, leaving the plaintiffs to suffer irreparable harm without an adequate remedy at law.

"The defendant's motion to dismiss the complaint alleged that: (1) the plaintiffs' lacked standing to maintain this suit because (a) no property right in a license was established, (b) only the Director of Registration and Education may enjoin violations under the Act; and (c) the plaintiffs have an adequate remedy at law; (2) section 1 of the Act (Ill. Rev. Stat. 1975, ch. 38, par. 202-1, now Ill. Rev. Stat. 1979, ch. 111, par. 2401), defining "Detection of Deception Examiner" is impermissibly vague and thus violates due process; (3) the same section is overbroad and therefore unconstitutional; (4) section 11 of the Act (Ill. Rev. Stat. 1975, ch. 38, par. 202-11, now Ill. Rev. Stat. 1979, ch. 111, par. 2412), permitting an examiner committee to conduct examinations without also prescribing standards, is unconstitutional; and (5) "the Statute" violates the special legislation provision of the Illinois Constitution (Ill. Const. 1970, art. IV, sec. 13) in that it confers special privileges upon licensed examiners granting them an arbitrary and exclusive right to determine who may be

licensed under the Act. Also, since section 1 requires that an intern be examined for a license without requiring the examiner to conduct an examination, it grants a "monopolistic special privilege" to examiners.

"The circuit court, in a cogent and exhaustive memorandum opinion, disagreed with the defendant and, on February 8, 1978, denied that motion to dismiss as well as a subsequent motion to dismiss the defendant had filed.

"Initially, it is argued by the plaintiffs that the appellate court should not have considered the constitutionality of section 3 because that issue was not raised by the defendant at the trial level. We disagree because the defendant alleged in his motion to dismiss that "the Statute" was special legislation. Section 3 would be included in this broad statement. Moreover, in his memorandum in support of his motion to dismiss, the defendant argued the precise point considered by the appellate court, saying in effect that section 3 gave a monopoly in perpetuity to polygraph operators. Therefore, the issue was properly before the appellate court.

"The appellate court based its reversal of the circuit court on the ground that section 3 of the Act is special legislation. That provision reads:

"Every examiner shall use an instrument which records permanently and simultaneously the subject's cardiovascular and respiratory patterns as minimum standards, but such an instrument may record additional psychological changes pertinent to the detection of deception. An examiner shall, upon written request of a person examined, make known the results of such test to the person examined within 5 days of receipt of the written request."

(Ill. Rev. Stat. 1979, ch. 111, par. 2403).

The parties state that the only instrument which records both a subject's cardiovascular and respiratory patterns is what is commonly called a polygraph machine.

"The appellate court held that section 3 of the Act is defective as special legislation because it grants a statutory preemption of the field of detection of deception to those persons trained to use a polygraph machine. (78 Ill. App. 3d 340, 344.) The court continued that a statute which grants a monopoly is not special legislation if it is reasonable, but that this act is unreasonable since it permits a licensed examiner to ignore the results of a polygraph test, thereby making superfluous the requirement that an examiner use a polygraph.

"The court also concluded that the Act is special legislation because it creates an unreasonable classification which is not reasonably related to the detection of deception or the protection of the public health, safety or welfare. That is because the Act requires the use of the polygraph, which favors polygraph operators and discriminates against those who use other deception-detection devices. The appellate court further held that the statute is unreasonable because, to be licensed under the Act, a person must complete a six-month course of study prescribed by the Department of Registration and Education which includes "History of Polygraph" & "Polygraph Technique."

The appellate court concluded that, since polygraph results may be ignored in favor of another device such as a PSE, such courses are irrelevant to a potential licensee's area of professional expertise.

"We are constrained to disagree with the conclusion of the appellate court since it assumes that while an examiner must use an instrument which records cardiovascular and respiratory patterns as minimum standards, an examiner is free to ignore the results which that instrument yields. We must presume that the statute is rational, and any construction which would bring about an illogical result must be discarded. (People v. Warren (1977), 69 Ill. 2d 620, 628.) Also, where upholding the constitutionality of a legislative enactment is a reasonable alternative, we have the obligation to do so. Anderson v. Schneider (1977), 67 Ill. 2d 165, 176.

"Therefore, we think the statute means that an examiner must use an instrument which records cardiovascular and respiratory patterns and must also use the results obtained from the test in formulating any analysis. It would be incongruous to require that a certain instrument be used in an examination but to permit the results from that examination to be ignored. We hold therefore that section 3 of the Act requires that cardiovascular and respiratory-pattern recordings must be used in any analysis of a detection-of-deception examination.

"Also, due to our holding that cardiovascular- and respiratory-pattern results must be considered in any analysis of a deception-detection examination, we think that the courses in polygraph history and technique are reasonably related to the legislative scheme and thus are calculated to enhance the expertise of the prospective licensee. See People v. Johnson (1970, 68 Ill. 2d 441, 447.

"In light of the foregoing construction of section 3, we look now to whether it is special legislation. Special legislation confers a special benefit or exclusive privilege on a person or a group of persons to the exclusion of others similarly situated. (Bridgewater v. Hotz (1972), 51 Ill.2d 103, 109-110.) It arbitrarily, and without a sound, reasonable basis, discriminates in favor of a select group. Such legislation differs from "local laws" because it is not limited to a geographical portion of the State. (Bridgewater v. Hotz (1972) 51 Ill. 2d 103, 109; G. Braden & R. Cohn, The Illinois Constitution: An Annotated and Comparative Analysis 206 (1969)). Special legislation differs from a violation of equal protection in that the latter consists of arbitrary and invidious discrimination against a person or a class of persons. It results from the governmental withholding of a right, privilege or benefit from a person or a class of persons without a reasonable basis (or, where a fundamental right or suspect classification is involved, a compelling State interest) for doing so. Whether a law is attacked as special legislation or as violative of equal protection it is still the duty of the courts to decide whether the classification is unreasonable in that it preferentially and arbitrarily includes a class (special legislation) to the exclusion of all others, or improperly denies a benefit to a class (equal protection). (See Anderson v. Wagner (1979), 79 Ill.2d 295, 315.) While certain pieces of legislation may be attacked as both special legislation and violative of equal protection since they confer a benefit on one class while denying a benefit to others, there will be many cases where a benefit is conferred on one class to which no other class has a right.

In those cases, legislation would be attacked as special legislation but not as violative of equal protection.

"The General Assembly has made a legislative judgment that to assure reasonably reliable and consistent detection-of-deception examinations, recordings of cardiovascular and respiratory patterns, at the least, are needed. While the ability and experience of each examiner may vary, The minimum objective standard will remain uniform. Also, an examiner may attempt to improve the reliability of the examinations he gives by using equipment which records additional physiological changes, such as galvanic skin reflex, inaudible voice tremors, and muscular movements and pressures.

"This case is distinguishable from People v. Schaeffer (1924), 310 Ill. 574, which struck down the medical practice acts of 1917 and 1899. Those acts arbitrarily exempted graduates of Illinois medical schools from taking a licensing examination, while requiring osteopaths who had studied the subjects necessary to be an osteopath in a college or hospital nonetheless to graduate from a medical school and pass a licensing examination. The court said: "This statute therefore tends to deprive the osteopaths of their Constitutional right to practice surgery; who are, so far as this record shows, just as efficient and as well prepared by college and hospital training to practice surgery as are the physicians of the medical schools. The act is therefore void as to such physicians so deprived." (310 Ill. 574, 583.) The comparison between osteopaths and users of the PSE is not parallel. There is still enough doubt about the reliability of detection-of-deception instruments, and the varying expertise of those who use them, to justify the General Assembly's decision to set minimum standards which prefer one instrument over another. As the appellate court correctly pointed out, the General Assembly has cast some doubt on the reliability of deception-detection instruments when it forbade the use of the results of any lie-detection device in criminal trials (Ill. Rev. Stat. 1977, ch. 38, par. 155-11) and provided that a court may not require a party to submit to a lie-detector test or to questioning under the effect of any chemical substance (Ill. Rev. Stat. 1977, ch. 110, par. 54.1). See Illinois Polygraph Society v. Pellicano (1979), 78 Ill.App. 3d 340, 342-43.

"We therefore think the legislative standard chosen by the General Assembly is reasonable and is well suited to encourage advances in the state of the art, while limiting inconsistent examination results based on the use of instruments which record different physiological changes and thus cannot be compared to one another. Section 3 of the Act, since it is reasonable, does not confer a monopoly upon licensed examiners. Also, by establishing a minimum standard of reliability, section 3 creates a classification that is reasonably related to the protection of the public health, safety and welfare. (Anderson v. Wagner (1979), 79 Ill.2d 295, 315.) Section 3 is general and not special legislation.

"We turn now to a discussion of whether the remainder of the Act is special legislation. The defendant contends that the Act bestows an exclusive privilege upon licensed examiners and arbitrarily and unreasonably excludes persons from becoming licensed under the Act.

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POLYGRAPH SAVES INNOCENT PERSON FROM PSE ERROR

FIRE MARSHAL BUREAU

On early Sunday morning, July 10, 1982, a fire occurred in an apartment in a suburb of St. Louis in which two young children were severely burned. An investigation revealed that the children and their mother were living in the apartment at the invitation of the male companion of the mother. Two neighboring tenants gave statements of seeing the estranged wife of the male companion in the immediate area of the apartment shortly before the fire was discovered. Also, the mother of the children who were burned, gave a statement of having seen this woman leaving the apartment at about the time of the fire. The investigation also indicated the estranged wife had been making threatening telephone calls to her husband and to the children's mother, and had also written several threatening letters to them. She was taken into custody, interviewed and subsequently administered a PSE examination for the investigating police agency. The PSE operator said the estranged wife was lying about starting the fire. She was then charged with assault in the first degree and arson.

After being held in custody for over three months, unable to post bond, the defendant agreed to a polygraph examination, suggested by prosecutor Clem Burns. The polygraph examination was administered by Sam M. Yarbrough of the St. Louis County Police Department, and the results indicated she was telling the truth in denying the crime. The mother of the burned children was then scheduled for a polygraph examination and during the pretest interview she admitted that she had set fire to their room in an attempt to kill the children, to be followed by her suicide. She could not bring herself to the final act. As a result, the first woman was released, and the mother was charged and is awaiting trial.

[ltr SMY 2 Dec]

FORMER POLICE CHIEF CLEARED OF ACCUSATION

A prison inmate, and admitted pornographer and convicted forger, one Jerry Sternlieb, executed sworn affidavits that Police Chief Bob Stover in 1976 and 1977 chauffeured him and another crook around Albuquerque. Stover, retired and running for Sheriff, was attacked with this information by the local paper, the Albuquerque Journal. When the former refused to agree to a polygraph test, Stover went to their competition, the Albuquerque Tribune which said they would arrange the test, but insisted on publishing the results regardless of the outcome.

Stover was tested in El Paso by Joe S. Gonzalez of Southwest Polygraph Services. The examination indicated Stover was telling the truth when he denied the meeting, and the matter was headline news the following day. Stover said that even though Sternlieb, when confronted, couldn't furnish any of the reasonable details that a person would remember if the event had taken place, it was difficult to disprove such an allegation. He was of the opinion that Sternlieb, who has filed affidavits about alleged connections with others in the political world, was seeking a letter to his parole board from the Journal to support his parole request.

[AT News 22 & 23 Apr, ltr JSG 27 Apr]

The greatest homage we can pay to truth is to use it.

- Emerson

X PSE Operator Prosecuted in South Carolina

The newsletter of the South Carolina Association of Polygraph Examiners of March 20, 1980 reports that "Johnny Hartley has just prosecuted a Georgia PSE examiner for testing with the PSE in South Carolina. The gentleman plead guilty and was fined. He had tested 31 people in about $\frac{1}{2}$ day."

* * * * *

X PSE Operators Freed in Alabama Trial

Following complaints to the state licensing board, the Birmingham Police Department obtained warrants for the arrest of PSE operators Ronald Lockhart and Larry Hacker of Lockhart Security and Investigative Service for conducting tests with a Psychological Stress Evaluator machine. A trial was held in Circuit Court in Birmingham and the charges were dismissed because the list of licensed examiners entered as evidence by Cecil Johnston, Secretary of the Board of Polygraph Examiners, had been prepared by his secretary, and she was not in court to testify to the authenticity of the list. Although the charges were dismissed on this technicality, Judge Jack Montgomery is reported to have expressed some doubts about the validity of the Alabama Polygraph Examiner Law. Accordingly, further opinions are being sought from the Attorney General of Alabama.

Jesse E. Sprayberry, President of the Alabama Association of Polygraph Examiners states that he will continue to work with the Alabama Board in an effort to prosecute persons purporting to be "Polygraph Examiners" when in fact they are not licensed in Alabama.

* * * * *

Contest for Student Papers on Loss Prevention

Three cash awards are being offered by the ASIS Foundation, a non-profit affiliate of the American Society for Industrial Security, for the best graduate and undergraduate papers on security and loss prevention submitted on or before July 1, 1980. President Robert D. Donovan has announced that a \$300.00 award will be made for the best graduate student entry, plus a \$200.00 and \$100.00 award for the best undergraduate entries.

In addition to the cash awards, the names of the winners will be announced at the ASIS Annual Seminar in Miami, Florida, September 1980, and subsequently printed in the society's official publication, Security Management. Also, the winning entries will be considered for publication. For information on contest rules, contact the ASIS Foundation, Inc., 2000 K St., N.W., Suite 651, Washington, D.C. 20006.

* * * * *

Note from the Managing Editor: I have sympathy for the census people who are trying to find their questionnaires. The APA Membership has moved over 200 times since September 1, 1979 and one member has moved four times since then. He doesn't have the record - seven times in one year. You can see how important it is to let us know you have moved. Please send your new address to P. O. Box 1061, Severna Park, Md. 21146. Save the association funds, don't make us buy your mail back for lack of new address.

The Board also voted to provide a special certificate of accreditation each year to each school. In addition, following receipt of the inspection fee, schools will receive free one of the new mahogany plaques with the APA seal for display in their school facilities.

* * * * *

New APA Publication on Training

The APA Board of Directors has approved a new quarterly publication entitled Polygraph Review. It will appear looseleaf so the reader may file the pages by topic. It will include questions and answers about a variety of topics, practice problems for use by schools and seminars, programmed instruction, bibliographies for study in preparing for state licensing examinations and the APA examination, illustrations, diagrams, schematics, charts and a variety of other useful materials. The Board has authorized an expenditure of \$2,500 for this purpose in the remainder of fiscal 1980. The material will be placed in the same envelope as the journal and law reporter, and the first issue will be in March.

All articles are to be signed, and a notice will point out that the material is not the official opinion of the APA. This notice is necessary because the APA does not specifically endorse techniques, instruments, or specific methods of chart interpretation. Members and non-members are invited to submit material for the review.

* * * * *

X PSE Operators Arrested in Alabama

Following complaints to the state licensing board, the Birmingham Police Department arrested Ronald Lockhart and Larry Hacker of Lockhart Security and Investigative Service for conducting tests with a Psychological Stress Evaluator machine. Newspaper reports state that Captain Jesse Sprayberry, Chief of Birmingham Police Department operations said the two men were charged with giving polygraph tests without a license and with administering an illegal type of lie detector test. The Attorney General has ruled the PSE tests illegal in Alabama and Sprayberry is reported to have said that the tests have been found to be inaccurate. Lockhart and Hacker are free on bond awaiting trial.

* * * * *

Polygraph Profession Goes to Press

The new APA booklet Polygraph Profession is going to the printer. Prepared by Norman Ansley and Stanley Abrams, the booklet is for the lay reader who wants general information about the use of the polygraph. It replaces prior publications The Polygraph Technique and the Polygraph Story, which are out of print but available from University Microfilms.* The booklet will be available during April 1980 and order forms will be in the next issue of the newsletter.

A few copies of the Polygraph Story are available in hard copy and may be ordered from APA Publications, P. O. Box 1061, Severna Park, Md. 21146 at \$3.95 each, postpaid.

SURPRISE! YOU ARE GIVING AN EXAMINATION

Dee Wheeler writes that while demonstrating a polygraph instrument in Mexico City as a guest lecturer at the National Congress of Security in November, he had the instrument attached to a Mexican attorney. Questions were being asked of the attorney by a Mexican polygraph examiner and Dee suddenly realized that an examination was in progress when there were Si's and No's with pauses between.

At the end of the chart the interpreter asked Dee "Where did he lie?" When he pointed out the lie, said Dee, "you would have thought I killed the bill!"

* * * * *

^ PSE EXAMINER CONVICTED IN TEXAS

In 1978 Woodrow Crowder was arrested and jailed for conducting a PSE examination in Montgomery County, Texas. Bond was set at \$1,500.

On February 13, 1979, the County Court at Law, Montgomery County, Conroe, Texas convicted Woodrow Crowder of violating Section 4 - Section 7, of the Polygraph Examiners Act. William W. Fisher, Vice-Chairman of the State Board of Polygraph Examiners, Judy Helmer of Helmer Polygraph Services, and Lynn Davis of the same company testified in court that they had observed the PSE test. The jury was out 20 minutes and returned with a guilty verdict. Judge Gualinne fined Crowder \$200.00 plus court costs with five days in jail, suspended, and six months unsupervised probation. The Judge told Crowder that any violation of this act would be prosecuted and he would then spend the five days in jail.

* * * * *

A TOY LIE DETECTOR IN A WATCH

On April 11th the Washington Post carried a story entitled "Lie Detector Watches Coming Soon for \$30" which describes the development of a silicon chip by Communication Control Systems which is intended to be the key element in a toy lie detector to be marketed by Christmas. The unit is designed to detect stress in the voice and illustrate the level of stress through eight tiny diodes running across the bottom of the watch crystal. The fewer the lights that light up, the greater the stress, say the manufacturers. More expensive models will provide numerical readings.

The manufacturer was asked why he would market the device, complete with a wristwatch, for \$29.95. He replied "I know we could sell it for more, but we want to start off big and choke off potential competition quickly." The prototype will cost \$105,000 and is anticipated by September. The maker expects that the unit will also appear later in other common articles such as fountain pens, belt buckles, and almost anything else. Modestly undercutting the price of a PSE by \$4,000, the accuracy of the toy is unknown, and apparently as far as the manufacturer is concerned, unimportant.

The company that will market the watch claims to gross 30 million dollars a year in digital watches, digital pocket calculators, and related products.

Asked if the product would not be so intrusive as to be immoral; CSC Vice President Carmine Pellisio responded "I've always thought it was immoral to lie."

PSE SCHOOL OWNER CHARGED WITH FELONY FRAUD IN VIRGINIA

Robert E. Kowalsky, Sr., has been charged with six counts of felony fraud in connection with the operation of a training school for prospective operators of the Psychological Stress Evaluator. He has also been booked on several misdemeanors: operating a business without a city license, operating a school without state certification, and operating a private investigating business without a license.

All of the charges are the result of an investigation into his operation of a school that advertised for trainees to operate the Psychological Stress Evaluator, an investigation initiated by the State Department of Professional and Occupational Regulation and conducted by the Chesapeake Police Department.

The Virginia-Pilot of May 6, 1977 reported that in telephone conversations with Kowalsky and a former associate, police learned that eleven students had enrolled in a 40-hour PSE course at a cost of \$200 each. Students were guaranteed lifetime job placement, starting with employment in Kowalsky's private investigative and security company, known as Kowalsky & Associates. Classes were held on the first day, April 18th, but the instructor left, and the remaining three days were cancelled by Kowalsky. Students were unable to obtain refunds of tuition money, said Lt. R. A. Justice, Head of the Internal Affairs Division of the Chesapeake Police Department. He noted that the trainees received some instruction material to study after the first day of classes but never had access to the PSE device, which Kowalsky said was on order.

Kowalsky was reported to be the sole officer of Kowalsky & Associates, a firm specializing in investigative, security and lie detector services. He was released from custody on his own recognizance and was to receive a court appointed attorney.

* * * * *

REPRESENTATIVE SCHROEDER FROM COLORADO ON THE POLYGRAPH

The Congressional Record of September 20, 1977, p. E5709 has a heading of "1984 at Coors: Polygraphs on Demand," by the Honorable Patricia Schroeder of Colorado. Mrs. Schroeder opened her brief remarks by mentioning an article that appeared in the Denver Post of August 30, 1977 which, she said, explains the reasons for the strike, and refutes assertions made by the company in a recent full page ad. She also entered into the record another article which appeared in the Rocky Mountain News of August 27th, also written by strikers, in which they claimed that their boycott is having an effect on Coors sales. She commended these articles to the attention of her colleagues. Of the two, only the first mentioned the polygraph. Representative Schroeder picked the polygraph as the item for her title when nine-tenths of the article is about other matters, including the lack of support for the strike among the employees, and the average income of \$19,500 for a production worker on the universal shift.

The letter to the Denver Post by striker Don Jorgenson speaks of the polygraph in one paragraph. He states:

"The latest contract proposal would require an employee to take a polygraph test at any time a supervisor requested him or

COMMITTEE

February 8, 1985

Representative Nathe

[illegible]

IF YOU CARE TO WRITE COMMENTS, ASK SECRETARY FOR WITNESS STATEMENT

PLEASE LEAVE PREPARED STATEMENT WITH SECRETARY.

QUESTIONS FROM THE COMMITTEE: None.

CLOSING STATEMENT: Representative Pistoria stated there really were no problems with the bill. He hopes the committee passes it with the amendment.

Hearing on HB 264 was closed.

CONSIDERATION OF HB 639: Representative Dennis Nathe, sponsor of HB 639, testified this is a polygraph licensing bill which he carried at the request of the Department of Commerce. It is a clean-up bill. The bottom of page 3 indicates a change in the time of year in which they must pay their licensing fees. Page 4, line 11, is a new section describing the internship licenses. Section 5 sets forth more criteria for the people who are being examined by polygraph and gives them the right to have the questions presented to them before they are asked by the examiner and gives them the right to terminate the examination at any time.

PROPOSERS: Mike Stotts, member of the Montana Association of Polygraph Examiners, testified they highly support the bill as amended. Mary Lou Garrett, of the Department of Commerce, urged support of the bill, especially the renewal section. They need it for administrative purposes.

QUESTIONS FROM THE COMMITTEE: Senator Towe questioned the reason for the fingerprint. Mr. Stotts replied we have people from out of state that are licensed to do polygraph examinations in Montana, and they are not necessarily in law enforcement, so they would like to be able to keep track of them and know who they are. Senator Towe asked how the fingerprints will help in this regard. Ms. Garrett replied there is a flyer that goes around the state. People are giving polygraphs for employment purposes, and these people are some fly-by-night group. They are not adequately trained or associated with any group. They are using the polygraph for blackmail. Senator Towe stated that is no different than any other occupational group of licenses. We don't want felons there either, but we don't require fingerprints. Ms. Garrett responded it is standard in other states for polygraph examiners.

CLOSING STATEMENT: None.

Hearing on HB 639 was closed.

CONSIDERATION OF HB 522: Representative Ray Peck, sponsor of HB 522, testified this bill was requested by the Hill County Attorney. It deals with property that is forfeited under the law and as to how they proceed on the forfeiture once they have the property in hand. It deals with

close to this. But if you are going to protect them, you have to do something like this. So far they have fought everything and don't want to do this. Senator Brown pointed out if you pass the bill with an amended effective date, you might as well kill the interim study. Senator Crippen replied sometimes when you are making sausage, you add garlic at the end. Senator Towe pointed out there is a lot more to the lien study than just this. This is one area that is a concern, but there are a lot of other areas, too. The motion to amend the effective date failed with Senators Blaylock, Pinsoneault, Shaw, and Towe voting in favor. Senator Towe moved HB 329 be recommended BE CONCURRED IN AS AMENDED. Senator Towe asked if anyone had any problem with the ten days. Senator Paul Boylan stated the material suppliers are against it. The motion carried with Senators Daniels, Mazurek, and Yellowtail voting in opposition.

ACTION ON HB 639: Senator Towe stated the main reason the bill came in is the language on the bottom of page 1. He had no objection to section 5 and felt it was good, but he didn't care about the internship. Senator Towe moved HB 639 be amended by striking subsection 7 on page 3, lines 14-17, along with the necessary technical amendments to accomplish this. The motion carried with Senator Pinsoneault voting in opposition. Senator Towe moved HB 639 be recommended BE CONCURRED IN AS AMENDED. The motion carried with Senators Daniels and Shaw voting in opposition.

ACTION ON HB 522: Senator Towe asked what the repealer was. Mr. Petesch responded some procedural things in the stolen livestock laws. Senator Mazurek commented this provides some protection to a person whose property was seized because it was used in the commission of a felony act. This gives you notice. Mr. Petesch stated the repealer is repealing the notice provision. Senator Mazurek asked if there were any other precedent for only one publication. Mr. Petesch answered this is existing statute. Senator Towe stated "and" on page 5, lines 4-8, is critical. The only vehicle that can be forfeited is if it is stolen and the owner is not in collusion with the guilty party, then it may be subject to forfeiture. We have a conjunctive in a negative. Senator Towe moved HB 522 be amended as follows:

1. Page 5, line 5.

Following: "if"

Insert: "(a)"

2. Page 5, line 7.

Following: "transportation"

Strike: "and"

Insert: ", or (b)"

March 7, 1985

Judiciary

#B 264, 293, 329, 522, 637

(Please leave prepared statement with Secretary)

STANDING COMMITTEE REPORT

March 7

1935

MR. PRESIDENT

We, your committee on.....JUDICIARY

having had under consideration.....HOUSE BILL.....No. 639

third reading copy (blue)
color

(Senator Daniels)

REVISION OF POLYGRAPH LICENSURE LAW

Respectfully report as follows: That.....HOUSE BILL.....No. 639

be amended as follows:

1. Title, lines 6 and 7.

Following: "TRAINING;" on line 6

Strike: remainder of line 6 through "APPLICANTS;" on line 7

2. Page 3, line 7.

Following: "and"

Insert: "and"

3. Page 3, lines 13 through 17.

Following: "license" on line 13

Strike: remainder of line 13 through "department" on line 17

AND AS AMENDED

BE CONCURRED IN

~~XXXXXXXXXX~~

~~XXXXXXXXXX~~

Senator Joe Mazurek

Chairman.

CLERICAL

Date: 3/9

House Bill 639

Time: 12:35pm

In accordance with Joint Rule 3-7(b) the following clerical errors may be corrected:

Senate Judiciary Committee 3/7

Title, line 12

following: "37-62-101"

strike: ", 37-62-202,"

Page 2, line 20

Strike ~~sub~~section 2 in its entirety
renumber subsequent sections

Page 6, line 24

Page 7, line 1

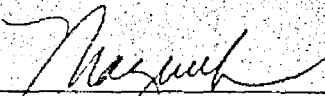
strike: "4"

insert: "3"

strike: "5"

insert "4"

Reason - 37-62-202 is
restored to unamended
version - must be
stricken fr. bill.



Sponsor

MER

Secretary of Senate
or
Chief Clerk

Legislative Council